RECORD OF DECISION,
DECISION SUMMARY, AND
RESPONSIVENESS SUMMARY

FOR

INTERIM RESPONSE ACTION
TELEDYNE WAH CHANG ALBANY SUPERFUND SITE
OPERABLE UNIT #1 (SLUDGE PONDS UNIT)
ALBANY, OREGON

DECEMBER 1989

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION
INTERIM RESPONSE ACTION

TELEDYNE WAH CHANG ALBANY SUPERFUND SITE
OPERABLE UNIT #1
ALBANY, OREGON

RECORD OF DECISION
INTERIM ACTION SELECTION (SLUDGE PONDS UNIT)
TELEDYNE WAH CHANG ALBANY
ALBANY, OREGON

Statement of Basis and Purpose

This decision document presents the selected remedial action for the sludge pond unit at the Teledyne Wah Chang Albany (TWCA) site in Millersburg, Oregon, just north of Albany, developed in accordance with CERCLA (42 U.S.C. §9601), as amended by SARA and, to the extent practicable, the National Contingency Plan.

This decision is based on the administrative record for this site. A copy of the administrative record index is attached as Appendix C.

The state of Oregon has concurred in the selected remedy. A copy of the state's letter is attached as Appendix B.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The sludge unit addressed by this ROD is the first operable unit to be addressed at the TWCA site. The Remedial Investigation/Feasibility Study (RI/FS) for the unit did not include certain components of a normal RI/FS, such as a complete baseline risk assessment, because these will be part of an overall site RI/FS (currently in the RI stage with the FS scheduled for completion in 1991). The sludge pond unit is being dealt with separately due to the property owners', and the public's, wish for an expeditious cleanup of the sludges, which may be contributing to groundwater contamination at the site.

The remedy consists of:

- Digging up and removing the sludge.
- Partially solidifying the sludge with a solidification agent such as Portland cement, to improve handling and reduce the gross mobility of the solids. A treatment plant will be built for this purpose.
- Transporting the sludge mixture to a solid waste landfill and disposing of it offsite.

The wastes being addressed in this Interim Action are not hazardous wastes as defined by the Resource Conservation and Recovery Act (RCRA); therefore, the RCRA Land Disposal Restrictions do not apply.

When the overall site Feasibility Study is completed, the sludge unit remedy will be reviewed to assure consistency with the overall remedial strategy for the TWCA site.

Declaration

This Interim Action is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This Interim Action utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. This action does not constitute the final remedy for the site, but the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element of the overall site remedy is addressed for this action and will also be addressed for the final response action. Subsequent actions are planned to address fully the principal threats posed by this site.

Robert A. Bernd Jr. — 12/26/89

Regional Administrator
EPA Region 10

Date

DECISION SUMMARY
INTERIM RESPONSE ACTION

TELEDYNE WAH CHANG ALBANY SUPERFUND SITE
OPERABLE UNIT #1
ALBANY, OREGON

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SITE NAME

Teledyne Wah Chang Albany (TWCA), Albany, Oregon

LOCATION AND DESCRIPTION

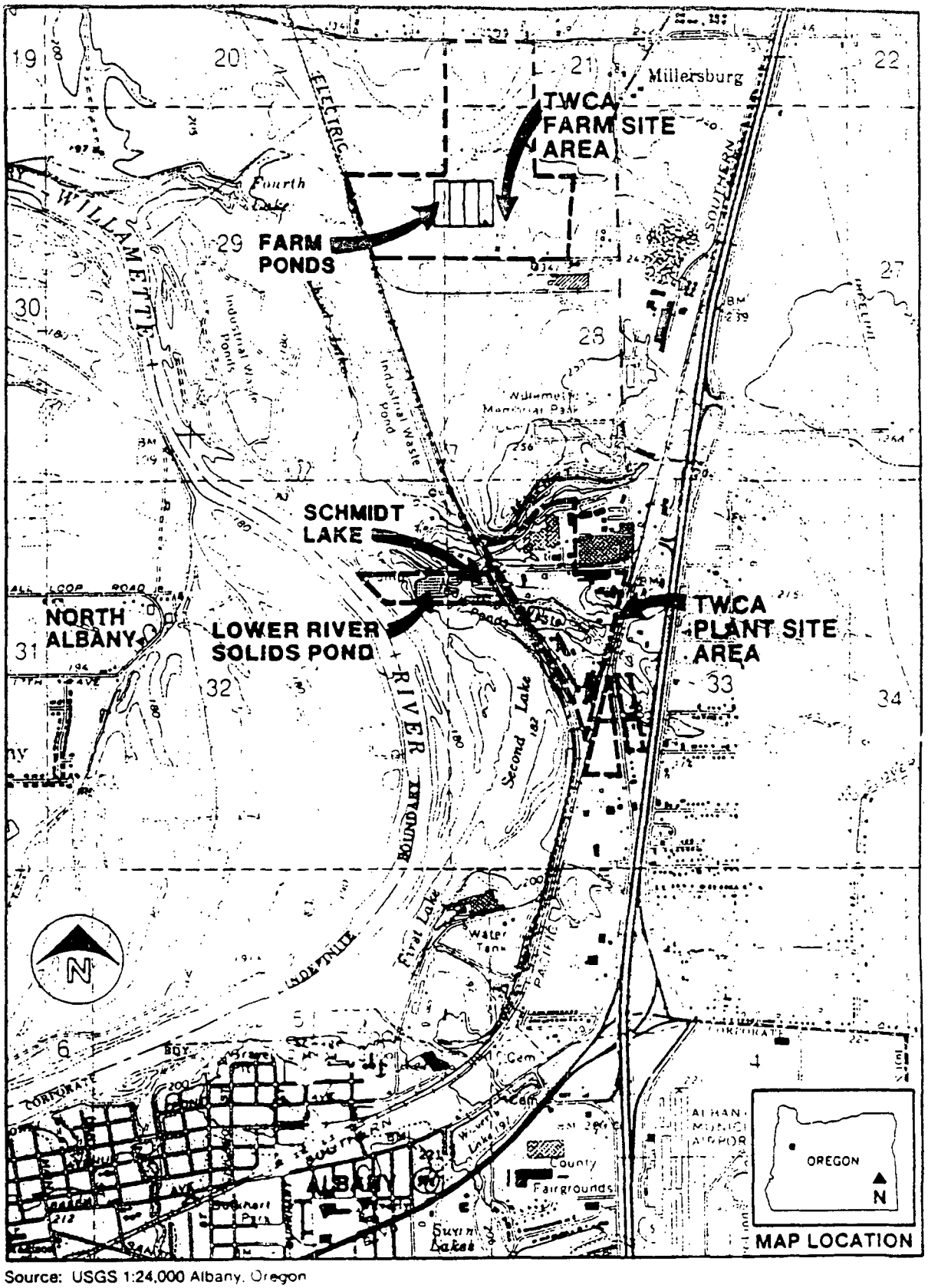
The TWCA facility is located in Millersburg, Oregon (about three miles north of Albany) in the Willamette Valley (see Figure 1). The Superfund site includes the 110 acre plant site property and the 115 acre facility known as the "farm site", which has the plant's active wastewater treatment sludge ponds ("farm ponds") and is located approximately 3/4 mile north of the plant site. Operable Unit #1, the unit addressed by this Interim Action, includes the solids in the Lower River Solids Pond (LRSP) and Schmidt Lake, which are located on the plant site near the Willamette River and have not been used since 1979.

Of the two major site areas, the plant site contains numerous buildings and facilities including an extraction area south of Truax Creek, a fabrication area north of Truax Creek, a solids storage area west of the Burlington Northern Railroad, and a parking and recreation area east of the Southern Pacific Railroad. The farm site contains four 2-1/2 acre solids storage ponds. The remainder of the site is used primarily for agriculture. The plant is currently operating and employs over 1300 people, making it the largest employer in the Albany area.

The LRSP and Schmidt Lake lie in the western portion of the plant site, next to the east bank of the Willamette River, between Murder Creek to the north and Truax Creek to the south (see Figure 2). The LRSP covers just over 3 acres and holds approximately 75,000 cubic yards of sludge; Schmidt Lake covers roughly 0.6 acre and contains approximately 10,000 cubic yards of material. The sludge in both ponds averages 40 percent solids. Both ponds are diked to contain the sludge, which also allows rainwater to collect on the top of the sludge; the rainwater is collected and pumped back to the plant wastewater treatment facility for treatment. The top few feet of the sludge in both ponds have deep cracks that remain year-round. Most of the surface of the LRSP stays wet throughout the year, but the surface of Schmidt Lake dries to dust during the summer.

Portions of the TWCA site, including the sludge ponds, are in the 100-year and 500-year flood plains of the Willamette River. The ground surface in the vicinity of TWCA slopes westward towards the river with a gradient of approximately 11 feet per mile.

Willamette Valley temperatures are moderate, with maximums seldom reaching 100° F and minimums rarely reaching 0° F. Roughly 70 percent of the 40-inch annual precipitation falls during November through March, while only 6 percent occurs during June, July, and August; fall and winter precipitation is the primary source of aquifer recharge in the area. There are usually only 3 or 4 days per year with measurable amounts of snow.



Source: USGS 1:24,000 Albany, Oregon

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SCALE

Figure 1
LOCATION MAP
Teledyne Wah Chang Albany
Albany, Oregon

CH2M HILL

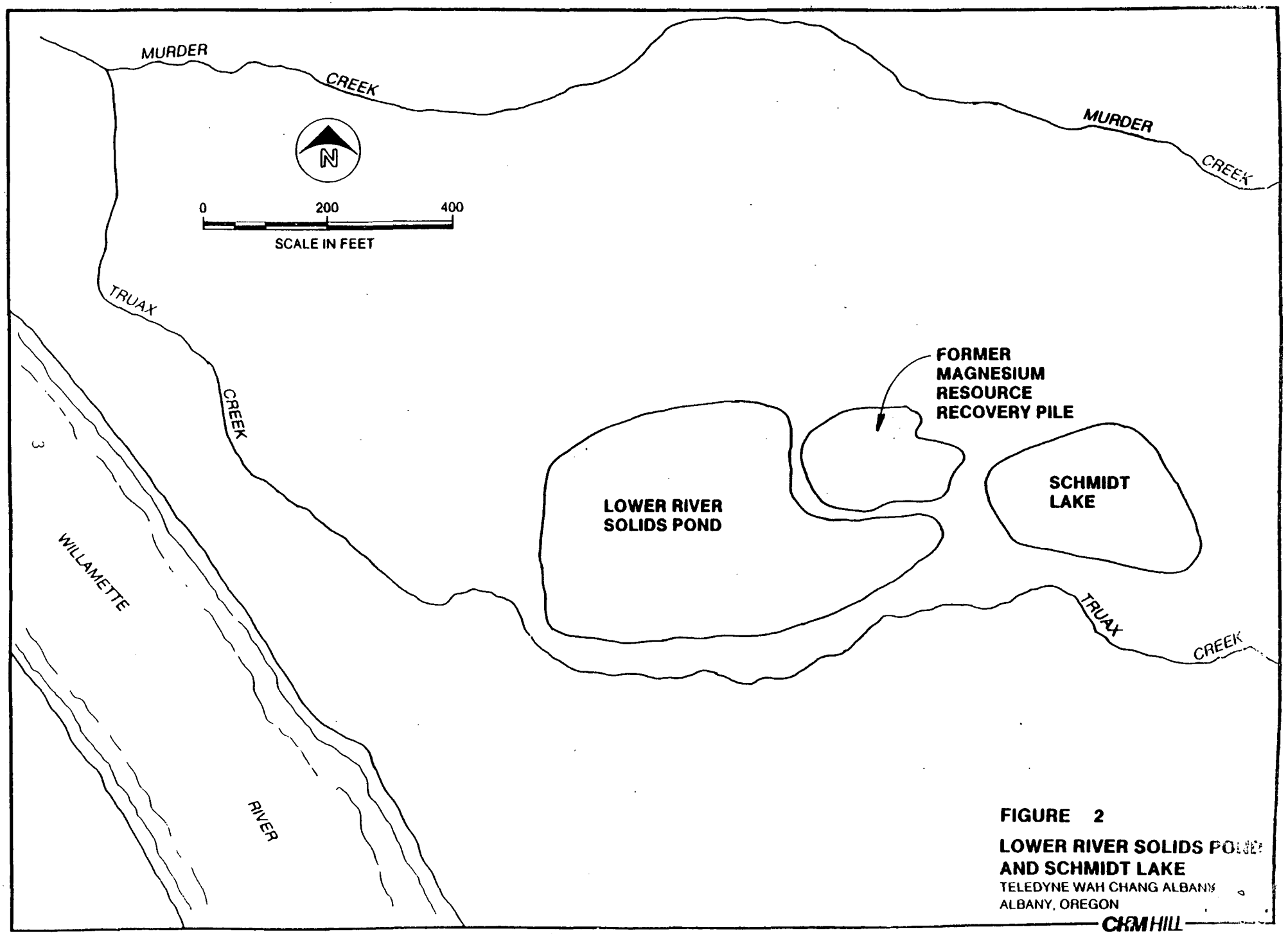

FIGURE 2

LOWER RIVER SOLIDS POND AND SCHMIDT LAKE

TELEDYNE WAH CHANG ALBANY
ALBANY, OREGON

CH2M HILL

The immediate area surrounding TWCA is primarily industrial, with some land to the north being used for agriculture. The land east of Interstate 5 and south of the plant site is used mainly for residential and commercial purposes, while land west of the Willamette River, which borders the plant site, is used for farming. Albany, the urban area to the south of the site, has a population of approximately 27,000; Millersburg has a population of about 560.

There are approximately 250 known private drinking water wells within three miles of the facility; all of these wells are upgradient of the site. There are no known domestic, municipal, industrial, or irrigation wells located between the site and the Willamette River. The Willamette River is not used as a drinking water source in this area.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

Operations at the TWCA site began in 1956 when, under contract with the U.S. Atomic Energy Commission, Wah Chang Corporation began operation of the U.S. Bureau of Mines, Zirconium Metal Sponge Pilot Plant. Construction of new facilities at the existing plant began in 1957. These facilities were built primarily for the production of zirconium and hafnium sponge. However, tantalum and niobium pilot facilities were later included. Melting and fabrication operations were added starting in 1959. TWCA was established in 1967 after Teledyne Industries, Inc., purchased Wah Chang Corporation of New York.

Because of the many processes involved in the production of nonferrous metals and products, waste management programs at TWCA consist of a wide range of activities, including: process wastewater treatment; solid waste management; hazardous waste management; PCB equipment management; radioactive material control; waste minimization through beneficial use; and air quality control programs. Discharge of process wastewater is regulated by a National Pollutant Discharge Elimination System (NPDES) permit. An Air Contaminant Discharge Permit regulates air emissions at the facility. Teledyne is currently classified as a hazardous waste generator under the Resource Conservation and Recovery Act (RCRA) program.

The LRSP was constructed and placed into operation in 1967 to receive lime solids (sludge) from TWCA's onsite wastewater treatment plant; Schmidt Lake was constructed for the same purpose in 1974. Sludge was pumped into the two ponds until October 1979, when the farm ponds to the north of the facility were put into operation. The farm ponds were originally part of this operable unit, but because they are outside the flood plain and contain lower levels of radioactivity, they are not considered an immediate threat and are now being investigated as part of the overall site Remedial Investigation (RI). The sludge in both the LRSP and Schmidt Lake contains heavy metals, a few organic compounds, and trace levels of some radionuclides. Tables 1-4 summarize the contaminants found in the sludge.

In 1978, TWCA modified the process for the production of zirconium and hafnium metal such that radioactive materials were directed into a separate solid waste referred to as chlorinator residue. This residue is managed as a low specific activity radioactive waste and shipped to Hanford, Washington, for disposal. Sludge generated since the implementation of this modification has been stored in the farm ponds.

Enforcement History

The sludge ponds have attracted the attention of regulatory agencies and the public for many years, particularly because of the presence of low-grade radioactive materials which was first confirmed by the Oregon State Health Division in 1977. In March 1978, TWCA was granted a Radioactive Materials License to transfer, receive, possess, and use zircon sands and industrial byproducts containing licensable concentrations of radioactive materials. TWCA took samples from the ponds on several occasions in 1979 and 1980.

Table 1
INORGANIC CONTAMINANTS IN LRSP SOLIDS

	Detects/ Samples	Maximum	Minimum[a]	Average[b]	Background[c]
Arsenic	40/40	39	2	10	24
Barium	39/40	3,500	33	173	116
Beryllium	20/40	1.3	0.5	0.7	0.7
Chromium	39/40	220	65	100	20
Copper	40/40	77	29	48	12
Mercury	36/40	7.6	0.3	1.2	<0.2
Nickel	40/40	3,000	25	206	14
Lead	40/40	260	38	102	10
Antimony	29/40	24	5	11	<20
Selenium	35/40	16	1	3	3
Thorium	40/40	74 (8.3)	11 (1.2)	31.7 (3.5)	3.5
Uranium	40/40	129 (87.8)	12.7 (6.4)	69.2 (46.5)	0.8
Zinc	40/40	87	24	40	39
Cyanide	28/40	165.0	3.0	16	<2
Radium[d] Activity Concentration	40/40	(22.2) 2.30×10^{-5}	(3.2) 3.32×10^{-6}	(13.2) 1.37×10^{-5}	(1.0) 1.04×10^{-6}
Zirconium[e]	40/40	10.0	3.0	5.1	<1.0

Note: All concentrations in mg/kg of as-received, wet solids.
Concentrations in parentheses are in pCi/g.
Only constituents that were detected in 10 percent or more of the samples are shown.

[a] Minimum value detected above detection limit.

[b] Geometric average. Duplicates were averaged to obtain one value that was then included in the geometric average. No values below detection limits were included in the average.

[c] From soil samples taken east of the existing Farm Ponds, October 1988. See RI report.

[d] As radium-226.

[e] Zirconium is expressed as a percent.

Table 2
INORGANIC CONTAMINANTS IN SCHMIDT LAKE SOLIDS

	Detects/ Samples	Maximum	Minimum[a]	Average[b]	Background[c]
Arsenic	10/10	36	8	16	24
Barium	10/10	72	36	39	116
Beryllium	10/10	1.1	0.7	0.8	0.7
Cadmium	7/10	1.2	0.1	0.3	<0.1
Chromium	10/10	13	79	90	20
Copper	10/10	72	34	45	12
Mercury	4/10	1.4	0.2	0.6	<0.2
Nickel	10/10	4,300	1,700	2,600	14
Lead	10/10	150	70	103	10
Antimony	10/10	14	8	9	<20
Selenium	7/10	4	1	2	3
Thorium	10/10	59.3 (7.5)	30.8 (3.4)	46.3 (5.1)	3.5
Uranium	10/10	237.7 (160.9)	104.6 (70.8)	162.6 (110.1)	0.8
Zinc	10/10	97	50	67	39
Cyanide	4/10	110	2.5	5.3	<2
Radium[d] Activity Concentration	10/10	(26.4) 2.54×10^{-5}	(14.9) 1.44×10^{-5}	(19.2) 1.85×10^{-5}	(1.0) 9.64×10^{-7}
Zirconium[e]	10/10	28.8	3.9	7.4	<1.0

Note: All concentrations in mg/kg of as-received, wet solids.
Concentrations in parentheses are in pCi/g.
Only constituents that were detected in 10 percent or more of the samples are shown.

[a]Minimum value detected above detection limit.

[b]Geometric average. Duplicates were averaged to obtain one value that was then included in the geometric average. No values below detection limit were included in the average.

[c]From soil samples taken east of the Farm Ponds, October 1988. See RI report.

[d]As radium -226.

[e]Zirconium is expressed as a percent.

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Table 3
ORGANIC CONTAMINANTS IN LRSP SOLIDS

Volatiles	Detects/ Samples	Maximum	Minimum[a]	Average[b]
Methylene chloride	36/40	22.000	0.006	0.084
1,1,1,-Trichloroethane	7/40	0.860	0.053	0.155
4-Methyl-2-pentanone	23/40	1,400.000	0.040	3.929
1,1-Dichloroethane	12/40	0.860	0.053	0.174
Tetrachloroethene	19/40	0.970	0.005	0.164
Semivolatiles				
Hexachlorobenzene	39/40	64.000	0.740	6.600
bis(2-ethyl-hexyl) phthalate	5/40	1.700	1.000	1.295

Note: All concentrations in mg/kg dry weight.
Only compounds that were detected in 10 percent or more of the samples are shown.

[a]Minimum value detected above detection limit.

[b]Geometric average. Duplicates were averaged to obtain one value that was then included in the geometric average. No values below detection limit were included in the average.

Table 4
ORGANIC CONTAMINANTS IN SCHMIDT LAKE SOLIDS

Volatiles	Detects/ Samples	Maximum	Minimum[a]	Average[b]
Methylene chloride	10/10	0.090	0.031	0.046
1,1,1,-Trichloroethane	4/10	0.320	0.073	0.168
4-Methyl-2-pentanone	3/10	54.000	24.000	32.708
1,1-Dichloroethane	5/10	3.900	0.170	1.054
Tetrachloroethene	1/10	0.073	0.073	0.073
Semivolatiles				
Hexachlorobenzene	10/10	25.333	7.300	14.087
bis(2-ethyl-hexyl) phthalate	1/10	1.000	1.000	1.000
N-Nitroso-di-n-propylamine	2/10	0.590	0.190	0.048

Note: All concentrations in mg/kg dry weight.
Only compounds that were detected in 10 percent or more of the samples are shown.

[a] Minimum value detected above detection limit.

[b] Geometric average. Duplicates were averaged to obtain one value that was then included in the geometric average. No values below detection limit were included in the average.

In 1981, the company applied to the state of Oregon's Energy Facility Siting Council (EFSC) for a site certificate to close LRSP and to store approximately 120,000 cubic yards of lime solids. The TWCA facility was listed on the National Priorities List (NPL) in October 1983. After several years of hearings, court actions, and further sampling, EFSC ruled in 1987 that the sludge was not subject to their jurisdiction, the levels of radioactivity being too low. TWCA then submitted a closure plan to the Oregon State Health Division, but EPA and other agencies recommended that closure not take place until after the conclusion of the RI. On May 4, 1987, TWCA signed a Consent Order agreeing to conduct the Remedial Investigation/Feasibility Study (RI/FS).

The TWCA facility holds permits for water and air emissions. It was found in violation of wastewater discharge permits in 1975, 1977, and 1978; subsequent process changes reduced the toxicity of the facility's wastewater discharges. TWCA was assessed fines for other water quality permit violations in 1979, 1980, and 1989. The company was fined for illegal open burning in 1983. In 1986, TWCA was cited for several violations of the state's hazardous waste management rules.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

TWCA and its activities have always been of interest to the community. Historically, the environmental issue of greatest local concern has been odor from the plant. Process changes have since reduced the odor and the number of complaints about it.

TWCA came to the attention of state environmental groups again in 1982, when it submitted its disposal plan to EFSC and became known as a source of radioactive contaminants. One of the groups, Forelaws on Board, has sponsored three state ballot initiatives proposing tighter standards for licensing such disposal facilities (one passed, two failed), and has also appealed the final EFSC ruling, which was upheld by the Oregon State Supreme Court in July 1988. Greenpeace staged two protests on the issue in 1985.

The following EPA community relations activities have been conducted at TWCA under Superfund:

- December 1982 - site proposed for inclusion on the NPL.
- October 1983 - site listed on NPL.
- February-May 1987 - local citizens and officials interviewed in order to prepare a Community Relations Plan.
- November 1987 - final Community Relations Plan issued.
- November 1987 - Information Repositories established at Albany Public Library, Department of Environmental Quality (Portland), and EPA Region 10 (Seattle).
- November 1988 - RI/FS work plan for entire facility sent out for 30-day public comment period. Work plan was placed in information repositories and a fact sheet was published.
- February 1989 - Fact sheet published announcing EPA's approval of the final work plan.
- June 1989 - Fact sheet published announcing that TWCA had submitted a draft RI/FS report to EPA for Operable Unit #1.
- August 16, 1989 - Interim Action (Operable Unit #1) Proposed Plan published.
- August 18 - October 16, 1989 - Public comment period for the Proposed Plan.
- September 6, 1989 - Public meeting for the Proposed Plan held in Albany. This meeting was announced in the Proposed Plan and a local newspaper.

SCOPE AND ROLE OF OPERABLE UNIT WITHIN SITE STRATEGY

EPA and TWCA decided to separate the sludge ponds operable unit from the rest of the site in the summer of 1988, soon after commencement of the overall site RI, because:

a) the ponds are a likely source of groundwater contamination;
b) they are located in the Willamette River flood plain;
c) they contain radioactive materials, and thus have been the focus of community concerns about the site; and
d) TWCA, in response to these concerns, wishes to clean up the ponds without waiting for the full site RI/FS to be completed.

The potential for groundwater contamination alone justifies a separate, expedited action. Other potential sources of groundwater contamination include onsite process plants, drains, and farm ponds, as well as several offsite sources, such as neighboring pulp and paper plants. The relative importance of each of these sources, as well as the nature and extent of contamination, are the focus of the RI for the overall site.

The overall site RI/FS is underway and Phase I is scheduled for completion in 1990. To the extent possible, this Interim Action is consistent with future activities.

SUMMARY OF SITE CHARACTERISTICS

Contaminants Present

The sludge in the LRSP and Schmidt Lake was sampled and contains metal compounds produced by the various onsite processing units, including zirconium, hafnium, chromium, mercury, nickel, uranium, and radium; cyanide has also been found. Of organic compounds detected, the most prevalent one is hexachlorobenzene, which is probably a byproduct of plant operations (Tables 1-4).

TWCA's wastewater treatment system consists of a continuous chemical precipitation and sedimentation system. Metals are treated by neutralization with lime, magnesium hydroxide, or sulfuric acid and carbon dioxide to a pH range between 6 and 8 to form metal hydroxides and sulfates which will precipitate. Fluorides are removed by the formation of calcium fluoride. These compounds are removed in a clarifier by settling. Lime solids, referred to as "sludge", generated from the operation of the clarifier are placed in sludge ponds for additional settling, dewatering and storage.

Potential Routes of Migration

The LRSP and Schmidt Lake are unlined impoundments constructed on native soils in the Willamette River flood plain; thus, flooding is one potential cause of contaminant migration. Because the ponds are unlined, they could also be a source of groundwater contamination. Another possible route is dermal contact with the sludge by onsite workers or trespassers. A fourth potential route, dust, is a major concern because the dried sludge material can be spread by wind. Some dust is created when the surface of Schmidt Lake dries during the summer, and more could be created by sludge treatment or removal activities. Fortunately, most of the sludge contains a high percentage of water, which limits its migration as a dust.

SUMMARY OF SITE RISKS

The following assessment is based on the data generated and presented in the TWCA Operable Unit Remedial Investigation (OURI) report and deals only with the potential hazards associated with exposure to the sludges in the ponds. Any potential hazards associated with contaminated soils beneath or surrounding the sludges or with groundwater associated with the ponds will be evaluated as part of the overall site RI/FS. A baseline risk assessment is a part of the overall RI/FS.

Identification of Contaminants of Concern

During the OURI, sludges in the LRSP and Schmidt Lake were found to contain inorganic elements, organic compounds, and radionuclides. In estimating average concentrations, a value of one-half the method detection limit (MDL) was assumed for cases where no detectable contaminant quantities were found. Of all the chemicals measured in the sludges, the inorganic elements, particularly zirconium, were found in the highest concentrations.

Thirty-four chemical substances were detected and positively identified in the LRSP and Schmidt Lake sludges during the RI. In addition, several tentatively identified compounds were also detected. Of the 34 positively identified chemicals, 26 are chemicals of concern and potential contributors to public health risk.

For carcinogens, since there is no safe dose, an estimate of the likelihood of developing cancer is derived from the average daily dose over a lifetime multiplied by the potency factor for that particular chemical. The potency factor is the plausible upper bound estimate of the probability of a response per unit intake of a chemical over a lifetime. EPA has developed a classification system (A-E) for chemicals which have been evaluated as potential carcinogens. The system is based on a weight of evidence scheme, with those chemicals being known human carcinogens considered as A carcinogens and those for which there is no evidence of carcinogenicity in the E category.

For non-carcinogens, the average daily dose over the period of exposure is compared to a reference dose or other toxicity constant. A reference dose is an estimate (with a safety factor of 10 to 1000) of a daily exposure level for the human population that could occur without producing harmful health effects. Non-carcinogenic effects include behavior changes, nervous system disorders, birth defects, and damage to kidneys, blood, liver and lungs.

Carcinogens

Twelve (non-radionuclide) chemicals found in the pond sludges may cause cancer. Three elements--arsenic, chromium, and nickel--are known to have the potential for causing cancer in humans when inhaled. Analyses done at TWCA were for total chromium, with the type unspecified; in order to be more protective of public health, this risk assessment is based on chromium VI (the most toxic form). Eight chemicals are probable human carcinogens through either ingestion or inhalation (Group B) and one is a possible human carcinogen (Group C). Potency estimates and EPA classification for these chemicals are provided in Table 5.

TABLE 5

TELEDYNE WAH CHANG
OPERABLE UNIT NUMBER ONE
HUMAN HEALTH RISK ASSESSMENT

CONTAMINANT	CANCER POTENCY		
	ORAL (mg/kg/d)^(-1)	INHALATION (mg/kg/d)^(-1)	EPA CLASSIFICATION
Arsenic	1.50E+00	1.50E+01	A
Beryllium	4.80E+00	8.40E+00	B2
Bisethylhexylphthalate	1.40E-02		B2
Cadmium		6.10E+00	B1
Chromium VI		4.10E+00	A
Hexachlorobenzene	1.67E+00		B2
Methylene chloride	7.50E-03	1.40E-02	B2
Nickel		8.40E-01	A
Tetrachloroethene	5.10E-02	3.30E-03	B2
Trichloroethene	1.10E-02	1.30E-02	B2
1,1 Dichloroethane		9.10E-02	C

Radionuclides

The presence of uranium, thorium, and radium isotopes in the sludges from Schmidt Lake and the LRSP presents the potential for radiation induced cancer. In the Teledyne Wah Chang Endangerment Assessment (part of the Operable Unit Feasibility Study), the committed dose equivalent was converted into an estimate of cancer risk using conversion factors from the "Effects on Populations of Exposure to Low-Levels of Ionizing Radiation" NAS, (1980), ranging from 67 to 227 cancer deaths per million-man-rem. These factors suggest that if one million individuals were each to receive one rem, then 67 to 227 excess cancer deaths would be observed. These conversion factors may be translated into estimates of individual cancer risk. The individual cancer death risk is 6.7×10^{-4} per rem. Recent information indicates that the maximum number of cancer deaths per million-man-rem should be 400 instead of 227. The new number of 400 cancer deaths per million-man-rem was used in the supplementary assessment to estimate maximum cancer deaths from radiation exposure. Radiation induced cancer is assumed to be fatal and chemically induced cancer may or may not be fatal.

Non-Carcinogens

For the non-carcinogens, antimony is likely to produce the most severe effect from the ingestion exposure route; barium from the inhalation route. Zirconium, which occurs at the highest concentration, is not acutely toxic, but accumulates in the body and may produce chronic effects.

Exposure Assessment

Under current and future operating conditions, if no cleanup actions are undertaken at the site, the most likely exposures are for workers and trespassers coming into direct contact with the chemicals in the sludge. In addition, if land use patterns change and the sludge site is opened to residential development, onsite residents may be exposed to contaminated sludges.

In order to estimate potential health risks from contact with the sludge, four exposure scenarios were evaluated in the risk assessment. Two scenarios were used to describe operations continuing at the facility with no corrective action. Under these two scenarios workers were assumed to come into direct contact with pond sludges for an average of 10 years and a maximum period of 40 years. For future risks, if the sludge site should become residential, it was assumed that the average resident would live on the site for 35 years and would be in direct contact with the sludges for 22 to 365 days per year. For the highest residential exposure, it is assumed that an individual would be in direct contact with the pond sludges for his or her entire lifetime (75 years) for 66 to 365 days per year.

Exposure estimates (total dose over a lifetime for carcinogens and over the exposure period for non-carcinogens) for ingestion of contaminated sludges and skin absorption of chemicals were based on average and maximum concentrations of chemicals measured in pond sludges. If the ponds dry, the sludges could be dispersed into the atmosphere by the wind or man's actions. In order to complete the assessment for inhalation of chemicals, maximum particulate concentrations were assumed to be equivalent to the federal particulate standard of 150 ug/cubic meter (National Ambient Air Quality

Standards, 40 CFR 50, particulate matter less than or equal to 10 microns, 24 hour average). A particulate concentration of 50 ug/cubic meter was used as an average exposure condition. In addition, contaminant concentrations were assumed to be the same in the airborne particulates as they are in the sludges, with particles being 100 percent respirable.

Risk Characterization

A summary of risk estimates for exposure to contaminated sludges is given in Table 6. As this is only a preliminary assessment for a portion of the TWCA facility, the summary risk estimates should not be viewed as a statement about health risks to residents in the vicinity of the site. The risk estimates presented in this report are representative of long term exposures to chemicals in the ponds (from 10 to 75 years) for average and maximum worst case scenarios. Future residential development on the sludge site without cleanup of the contaminants in the ponds is clearly the maximum worst case scenario. The purpose of evaluating this unlikely event is to provide EPA and the public with sufficient information to make a decision regarding the necessity for cleanup of toxic materials in the environment.

Another scenario which is viewed as a potential worst case event is the movement of contaminants into the Willamette River or nearby residential areas due to flooding. The probability of a flood overtopping the ponds has been estimated at a one in 500 year event. Due to this relatively small likelihood, and difficulty in predicting how contaminants would disperse if such an event should occur, risk estimates were not completed for this exposure pathway. However, one can assume that the residential scenario provides a measure of what health effects would be predicted if contact with contaminants should occur over a long period of time. Health risks due to flooding should not exceed those which are predicted for a residential exposure.

Cancer Risk Estimates

The risk of developing cancer ranges from less than one chance in one million to greater than one chance in one thousand, depending on the level and length of exposure. For onsite workers, the greatest risk of developing cancer is under maximum exposure conditions (40 years at work). Nickel, chromium VI, arsenic, and hexachlorobenzene are the major contributors to the increased cancer risk. The potential risk of developing cancer for people who may reside onsite in the future, if no action is taken, ranges from an additional cancer risk of one in one thousand to three in one thousand for exposure over a lifetime. Nickel, chromium VI, arsenic and hexachlorobenzene are also the major chemicals contributing to the cancer risk for this scenario.

The risks of death from cancer due to exposure to radionuclides if no cleanup action is taken are equivalent to those from other chemicals, ranging from seven in one million to one in one thousand. The greatest risk is for residents under maximum exposure conditions (75 years direct contact with pond sludges).

Non-cancer Risk Estimates

Under current or future operating conditions, risks of health effects other than cancer are only expected for the highest worker exposure (40 years

TABLE 6 TELEDYNE WAH CHANG
OPERABLE UNIT NUMBER ONE
HUMAN HEALTH RISK ASSESSMENT
RISK SUMMARY TABLE

EXPOSURE SCENARIO	EXPOSURE ROUTE	EXCESS LIFETIME CANCER RISK	HAZARD INDEX
FUTURE-NO ACTION* AVE. RESIDENT		NON-RADIOISOTOPES	
	INGESTION	8 x 10-05	1.2
	INHALATION	4 x 10-05	0.1
		RADIOISOTOPES	
	INGESTION	4 x 10-06	
	INHALATION	2 x 10-04	
	TOTAL RISK	3 x 10-04	1.3
FUTURE-NO ACTION* UPPER BOUND RESIDENT		NON-RADIOISOTOPES	
	INGESTION	1 x 10-03	10.8
	INHALATION	1 x 10-03	5.7
		RADIOISOTOPES	
	INGESTION	1 x 10-04	
	INHALATION	1 x 10-03	
	TOTAL RISK	3 x 10-03	16.5
FUTURE-NO ACTION* AVE. WORKER		NON-RADIOISOTOPES	
	INGESTION	4 x 10-07	0.05
	INHALATION	5 x 10-06	0.05
		RADIOISOTOPES	
	INGESTION	8 x 10-08	
	INHALATION	7 x 10-06	
	TOTAL RISK	1 x 10-05	1.0
FUTURE-NO ACTION* UPPER BOUND WORKER		NON-RADIOISOTOPES	
	INGESTION	8 x 10-05	1.1
	INHALATION	5 x 10-04	4.1
		RADIOISOTOPES	
	INGESTION	3 x 10-05	
	INHALATION	5 x 10-04	
	TOTAL RISK	1 x 10-03	5.2
SHORT-TERM WORKER**		NON-RADIOISOTOPES	
	INGESTION	1 x 10-06	0.74
	INHALATION	9 x 10-07	0.06
		RADIOISOTOPES	
	INGESTION	4 x 10-06	
	INHALATION	1 x 10-05	
	TOTAL RISK	2 x 10-05	0.8

TABLE 6 (cont'd)

TELEDYNE WAH CHANG
OPERABLE UNIT NUMBER ONE
HUMAN HEALTH RISK ASSESSMENT
RISK SUMMARY TABLE

EXPOSURE SCENARIO	EXPOSURE ROUTE	EXCESS LIFETIME CANCER RISK	HAZARD INDEX
TRESPASSER**		NON-RADIOISOTOPES	
	INGESTION	2 x 10-06	0.06
		RADIOISOTOPES	
	INGESTION	3 x 10-06	
	TOTAL RISK	5 x 10-06	0.06

*EPA, September 1989 Supplemental Risk Assessment
**Teledyne Wah Chang Albany, Operable Unit Number One Endangerment Assessment, August 1989

at the site.) Barium is the only chemical for which the average daily dose exceeded the reference dose. This was due to the high maximum concentration found at the site. At average concentrations, barium would not present a health risk.

Under a future no action assessment, the non-carcinogens are not a source of health risks to people under average residential conditions. However, under maximum exposure (high contact rates, longer duration and maximum concentrations) the risks of adverse health effects will exceed acceptable limits. The average daily dose of barium, nickel and uranium would exceed their respective reference doses under these maximum exposure conditions.

DESCRIPTION OF ALTERNATIVES

In the FS for this operable unit, seven cleanup alternatives, representing three different types of remediation--containment, onsite landfilling, offsite landfilling--were developed and analyzed in detail. Of these, the four most feasible and protective (numbers 1, 5, 6, and 7) were considered in the Comparative Analysis of Alternatives. The other three represent the same range of alternatives, with minor technical variations. The four alternatives given detailed evaluation are discussed below and in the following section, using the numbers assigned to them in the FS and Proposed Plan.

Offsite transportation of the sludge is a component of several remedial alternatives considered for this operable unit. Under a worst-case scenario, risk to workers from a spill is considered to be the same as for workers doing cleanup onsite.

The sludge is not a characteristic or listed hazardous waste under the Resource Conservation and Recovery Act (RCRA), so the Land Disposal Restrictions are not applicable and were not a consideration in selecting alternatives.

This Interim Action addresses only the sludge materials stored in the LRSP and Schmidt Lake, since they are the source of the contaminants of concern. The surrounding and underlying soils and dikes which will remain after any sludge relocation actions occur will be investigated as a part of the overall site RI/FS which is currently underway. The restoration of the wetlands or filling of the excavated ponds will also be part of the larger site study. The sludge materials can be visually distinguished from the soils forming the bottom and sides of the storage ponds.

Alternative 1: Consolidation, Barrier Wells, Capping, Flood Protection

This alternative consists of moving the sludge from Schmidt Lake into the LRSP, pumping and treating the groundwater downgradient of the impoundment, stabilizing the dikes, and capping the sludge to minimize infiltration of precipitation.

During the excavation of Schmidt Lake and transportation to the LRSP, dust control measures would be implemented as needed, including wetting of the surface sludge if necessary.

Approximately eight barrier wells would be installed in a semicircle formation downgradient of the LRSP. Extracted groundwater from each well would be channelled to a pipe for return to the existing plant wastewater treatment system for treatment and discharge.

According to an investigation by a TWCA contractor (Dames and Moore) in 1981, the existing LRSP dikes would be unstable during a major flood. Therefore, this alternative incorporates measures for stabilizing the dikes. This work would be accomplished by conventional earth-moving and compacting equipment.

An impermeable cap would be installed to minimize the infiltration of surface water into the LRSP and reduce migration of contaminants to groundwater. Capping would also eliminate dust and reduce radon flux. Dike stabilization will reduce the risk of contaminant dispersal by flooding. This alternative does not include any form of treatment of the sludge.

Applicable or relevant and appropriate standards (ARARs) include Executive Orders 11988 (Protection of Floodplains) and and 11990 (Protection of Wetlands), the Oregon Solid Waste Regulations (for capping), and State Historic Preservation Office regulations on identifying the potential for historic artifacts in previously undisturbed areas. The onsite wastewater treatment plant is subject to Clean Water Act requirements, including an NPDES permit. Clean Air Act and Occupational Safety and Health Administration (OSHA) regulations would apply during construction.

Operation and maintenance (O&M) for the barrier wells would be required for approximately 30 years. O&M for the flood protection and cap would consist of inspection and repair of observed damage twice each year. Groundwater would be monitored quarterly.

Implementation time for this alternative is estimated to be approximately one year, and present worth costs are estimated at $1.8 million.

Alternative 5: Removal, Solidification, Onsite Disposal

This alternative consists of constructing an onsite landfill east of the present farm ponds, removing the sludge from the LRSP and Schmidt Lake, solidifying the sludge by adding a solidification agent such as Portland cement, and placing it into the landfill.

The onsite landfill would be designed to contain the sludge with minimal infiltration from precipitation. The major features of the landfill would include:

- Above-grade construction to prevent infiltration of groundwater into the fill (the seasonal high water table in the area of the farm site is 1-3 feet below the existing ground surface).
- A gravel underdrain system to ensure that the water table remains below the bottom liner.
- A composite liner constructed above the gravel underdrain. Leachate (liquid runoff from the landfill) is not expected because the solids are nonbiodegradable and would be partially solidified; if leachate occurred, it would be pumped from the sump into containers or a tank truck and taken to the wastewater treatment plant.
- A landfill cover.

In order to mix the sludge with Portland cement (or whatever agent is selected), it would be removed from the river ponds and transported approximately one mile to the solidification mixing plant located near the landfill. Once solidified, it would be placed into the new landfill. The proposed solidification process is not total solidification but a partial treatment designed to improve handling and reduce moisture content in the

sludge. The solidification process also reduces leachate potential by chemically treating the sludges to bond the metal compounds within the sludge matrix.

Treatment of the sludge will reduce the gross mobility of the metal compounds, and landfilling will make the contaminants less accessible to human contact. This alternative also removes the contaminated materials from the flood plain. It would not reduce toxicity of the contaminants.

ARARs for this alternative include the substantive requirements of the Oregon Solid Waste Regulations for the landfill (though a permit will not be required). Clean Air Act and OSHA regulations will apply during construction. Wetlands should not be affected.

O&M for the landfill would consist of sampling and testing groundwater from monitoring wells, monitoring the leachate collection system, and inspecting and repairing any damage to the landfill.

This alternative would take approximately 2 years to implement. Present worth costs are estimated at $12.8 million.

Alternative 6: Removal, Offsite Disposal Without Treatment

Under this alternative, the sludge would be excavated and placed on a concrete slab where it would be allowed to drain excess water. It would then be loaded into watertight containers and hauled to a permitted disposal facility. Two new solid waste landfills in north-central Oregon which have recently been permitted and have the capacity to accept the solids are considered as possible facilities. Both are remote from population centers, with a depth to groundwater of at least 100 feet below ground surface and net annual precipitation of 4 inches or less. Both landfills have expressed an interest in receiving the sludges, which would be disposed in a cell separate from other wastes. A specific landfill would be selected as part of the Remedial Design process.

As with the preceding alternative, the sludge would be removed permanently from the flood plain, and the potential for human contact would be even further reduced by the landfill cap. The sludge would not be treated.

ARARs for offsite disposal include the Oregon Solid Waste Disposal Regulations. Both landfills being considered in Oregon already have state permits under these regulations. Hauling would need to be performed by a contractor authorized by the state as a solid waste hauler and in compliance with state of Oregon Public Utility Commission rules. Clean Air Act and OSHA regulations would again apply during construction.

There would be no O&M under this alternative, aside from routine maintenance to be performed by the landfill operator. Implementation time would be approximately 8-9 months. Present worth costs are estimated at $8.5 million.

Alternative 7: Removal, Solidification, Offsite Disposal

This alternative is the same as the preceding one, except that the sludge would be partially solidified with Portland cement (as in Alternative 5) prior

to offsite disposal. From the solidification plant, it would be hauled to an offsite landfill.

The advantages of offsite disposal would be combined with the reduction of gross mobility by partial solidification. ARARs would be the same as for Alternative 6.

There would be no O&M required under this alternative, except for landfill maintenance as under Alternative 6. Implementation would take approximately 9-10 months. Present worth costs are estimated at $10.7 million.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Each of the four alternatives described in the preceding section was evaluated according to the following nine criteria:

Threshold Criteria

1. Protectiveness of human health and the environment: whether or not the remedy provides adequate protection or describes the mechanisms for controlling risk for the different exposure pathways.

2. Compliance with ARARs: whether or not the remedy ensures compliance with ARARs of other federal and state environmental standards or statutes.

Primary Balancing Criteria

3. Long-term effectiveness and permanence: the ability of the remedy to provide protection and reduce risks to health and the environment after cleanup goals have been met.

4. Reduction of toxicity, mobility, or volume through treatment: the anticipated effectiveness of treatment technologies used.

5. Short-term effectiveness: the speed with which the remedy achieves protection, as well as any adverse effects which it may create during construction and implementation.

6. Implementability: the technical and administrative feasibility of the remedy.

7. Cost: includes capital and O&M costs.

Modifying Criteria

8. State acceptance: whether the state concurs with or opposes the remedy.

9. Community acceptance: whether or not the remedy is acceptable to the community, and how it addresses their continuing concerns about the site.

The following section describes how each alternative meets the various criteria. Table 7 provides a summary of the criteria assessment.

1. Protectiveness of Human Health and the Environment

Alternative 7 is the most protective, because it reduces contaminant mobility through solidification, removes the sludge from the flood plain, and places the sludge in a place where it will have minimal contact with the environment by any pathway (dermal, air, groundwater).

Alternative 6 is the next most protective, as it reduces risk of contact and removes the sludge from the floodplain, although it does not reduce contaminant mobility. Alternative 5 reduces mobility and removes the sludge

Table 7
SUMMARY OF CRITERIA ASSESSMENTS FOR INDIVIDUAL ALTERNATIVES

Criteria	Alternative 1 Barrier Wells, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification, Offsite Disposal
Overall Protectiveness				
Human Health Protection				
- Direct Contact/Solids Ingestion	Capping would reduce access to solids.	Landfilled solids would be inaccessible.	Solids landfilled in north central Oregon site would be remote from population centers and essentially inaccessible.	See Alternative 6. Effectiveness enhanced by solidification.
- Inhalation of Dust, Radon, Organic Vapors	Capping would prevent migration of metals and trace radionuclides in dust. Would reduce radon flux and volatilization of organics.	Landfilling would prevent migration of metals and trace radionuclides in dust. Would reduce radon flux and volatilization of organics. Solidification enhances protectiveness.	Landfilling would prevent migration of metals and trace radionuclides in dust. Would reduce radon flux and volatilization of organics.	See Alternative 5.
- Ingestion of Groundwater	To be addressed during overall site RI/FS.	See Alternative 1.	See Alternative 1.	See Alternative 1.
Environmental Protection				
- Dispersal by Flooding	Reduces risk of dispersal by flooding by stabilizing dikes.	Prevents dispersal by flooding by removing solids from the 500-year floodplain. Solidification enhances effectiveness.	Removes solids from floodplain.	See Alternative 5.
- Migration of TDS to Groundwater	Capping and barrier wells curtail further migration of TDS to groundwater.	Lined landfill prevents migration of TDS to groundwater.	Lined landfill, arid climate, and distance to groundwater minimizes risk of migration of TDS to groundwater.	See Alternative 6. Solidification enhances effectiveness.
- Aquifer Restoration	To be addressed during overall site RI/FS.	See Alternative 1.	See Alternative 1.	See Alternative 1
Compliance with ARARs	Satisfies solid waste closure requirements for closure of an existing solid waste disposal unit. Barrier wells may be needed indefinitely to prevent groundwater from entering the solids, and for use in long-term monitoring. Public access to the area must be restricted. Coordination with DEQ will be needed to comply with regulations governing wetlands, rivers, streams, and floodplains. An archaeological survey would be required for newly disturbed areas.	Solidification of LRSP solids and construction of new solid waste landfill would satisfy solid waste disposal and closure requirements. Long-term maintenance and monitoring of the landfill would be required, as well as treatment of any leachate collected. Public access to the area must be restricted. Coordination with DEQ will be needed to comply with regulations governing wetlands, rivers, streams, and floodplains. An archaeological survey would be required for newly disturbed areas.	Offsite disposal of solids from the LRSP and Schmidt Lake in a licensed solid waste disposal facility would satisfy solid waste disposal requirements. The solids would have to pass the paint filter test prior to disposal. The solids must be transported by a licensed hauler in approved vehicles.	Solidification of LRSP solids, and disposal of Schmidt Lake and LRSP solids in a licensed solid waste disposal facility would satisfy solid waste disposal requirements. The solids must be transported by a licensed hauler in approved vehicles.

Table 7
(Continued)

Criteria	Alternative 1 Barrier Wells, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification, Offsite Disposal
Long-Term Effectiveness and Permanence				
Magnitude of Residual Risk				
- Direct Contact/Solids Ingestion	Risk of direct contact/ingestion would be minimized with capping.	Minimal residual risk; solids would be solidified, totally enclosed in secure, monitored landfill.	Minimal residual risk. Solids landfilled at north central Oregon site would be remote from population centers and inaccessible.	See Alternative 6. Risk further reduced by solidification.
- Inhalation of Dust, Radon, Organic Vapors	Risk of inhalation of metals, trace radionuclides, and radon, and volatilization of organics would be minimized with capping.	Minimal residual risk of dust inhalation; radon exhalation and volatilization of organics would be reduced/eliminated by capping.	See Alternative 5.	See Alternative 5.
- Ingestion of Groundwater	To be addressed during overall site RI/FS.	See Alternative 1.	See Alternative 1.	See Alternative 1.
- Dispersal by Flooding	Would minimize but not eliminate risk of dispersal of solids by flooding.	Residual risk prevented.	Residual risk prevented.	Residual risk prevented.
- Migration of TDS to Groundwater	Some residual risk of further TDS to groundwater.	Risk minimized as long as integrity of lined landfill is maintained. Risk further reduced by solidification.	Risk minimized as long as integrity of lined landfill is maintained. Residual risk is also reduced by arid climate, depth to groundwater, and distance to groundwater discharge.	See Alternative 6. Risk further reduced by solidification.
Adequacy and Reliability of Controls				
- Reliability of Technologies	All technologies are simple, straightforward, and reliable.	Exact results of pozzolanic reaction cannot be predicted because of variability of solids. Increase in structural strength, reduction of gross mobility, and binding of interstitial water can be expected. Possible reduction of radon flux. Other technologies straightforward and reliable.	Reliable.	See Alternative 5.
- Long-Term Management	Operation of the barrier wells, maintenance of cap, and monitoring and treatment of the pumped water would be required. (Restoration of the aquifer in this area will be evaluated in the overall site RI/FS and may subsume the function of the barrier wells.)	Required for maintenance to ensure integrity of landfill.	Long-term management provided as integral part of existing landfilling service, under regulation by state.	See Alternative 6.
- Long-Term Monitoring	Required to prevent future migration of TDS to groundwater.	See Alternative 1.	Provided as integral part of existing landfill service, under state regulation.	See Alternative 6.
- Need for 5-year Review	Needs periodic (5-year) review.	Needs periodic (5-year) review.	No periodic review required.	No periodic review required.

Table 7
(Continued)

Criteria	Alternative 1 Barrier Walls, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification, Offsite Disposal
- Potential Need to Replace Technical Components	If components are given ongoing maintenance to prevent erosion, they should last indefinitely. Mechanical components, such as pumps, and screens, would need to be replaced periodically. Vendor estimates life of HDPE in absence of specific damage at 1,800 years.	See Alternative 1.	Operation, maintenance, closure, and post-closure will be performed in accordance with Oregon Administrative Rules in force at the time. No need to replace landfill components is anticipated.	See Alternative 6.
- Magnitude of Risk if Technical Components Fail	Risk to human health and environment if further migration of contaminants to groundwater occurs will be determined during overall site RI/FS. If dike failed or were breached during a flood, lime solids might be washed downstream, dispersed so widely as to be greatly diluted. High water at low velocities, however, might spread the solids over a smaller area as the flood receded, leaving a discernible layer of lime solids accessible to receptors.	Risk posed by contaminant migration to groundwater will be determined during overall site RI/FS. Likelihood of both landfill and pozzolanic reaction failing is small.	Geographic location and hydrogeologic setting are such that risk to human health and environment if technical components fail is minimal.	See Alternative 6.
Reduction of Toxicity, Mobility, or Volume Through Treatment				
Treatment Process	No treatment used.	Solidification.	No treatment used.	Solidification.
Toxicity	Waste is not amenable to reduction of its main toxic constituents through treatment.	See Alternative 1.	See Alternative 1.	See Alternative 1.
Mobility	Does not treat waste to reduce mobility.	Solidification reduces gross mobility; increases structural strength; binds interstitial water reducing TDS migration; reduces radon flux. Metals and radionuclides remain immobile.	See Alternative 1.	See Alternative 5.
Volume	Reduction of volume (by dewatering) would increase concentration of radionuclides, level of radon flux, and dust generation.	See Alternative 1.	See Alternative 1.	See Alternative 1.
Irreversibility	Not applicable--no treatment.	Pozzolanic reaction is irreversible. Resistance to physical degradation of treated solids cannot be predicted with certainty because of high TDS levels, including fluorides, chlorides, and sulfates.	Not applicable--no treatment.	See Alternative 5.

Table 7
(Continued)

Criteria	Alternative 1 Barrier Walls, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification, Offsite Disposal
Inherent Hazards Reduced by Treatment?	No	Possible reductions of radon flux. TDS expected to be less mobile. Metals and other radionuclides remain immobile.	No.	See Alternative 5.
Short-Term Effectiveness				
Protection of Community	Potential dust generation during excavation, hauling, and redisposal of Schmidt Lake will be addressed by wetting of surface solids, prompt cleanup of spills, frequent hosing of residues.	Potential dust generation during excavation, solidification, and landfilling will be addressed by wetting of surface solids, prompt cleanup of spills, frequent hosing of residues.	Potential dust generation during excavation, and hauling, will be addressed by wetting of surface solids, prompt cleanup of spills, frequent hosing of residues. Short-term risk is introduced by transport to landfill. (Rail transport will be investigated if this alternative is selected.)	See Alternatives 5 and 6.
Protection of Workers	Ingestion, prolonged dermal contact, and inhalation should be avoided and reasonable precautions taken. (See Appendix B.)	See Alternative 1.	See Alternative 1.	See Alternative 1.
Environmental Impacts	Short-term impacts from noise, construction, etc., will have minimal effects in this industrial area.	See Alternative 1.	See Alternative 1. Transport to landfill will have environmental impacts associated with truck emissions, traffic.	See Alternative 6.
Time to Achieve Objectives (Does not include planning and design periods.)	Approximately 1 year. Seasonal limitations: cap must be installed during summer, when surface solids are driest and can support workers and light equipment.	Approximately 2 years. Seasonal limitations: landfill construction limited to construction season (April to October) because of seasonally high water table (up to ground surface at times). Heavy winter rains would limit excavation, solidification, and landfilling to construction season.	8 to 9 months. Seasonal limitations: extremely heavy rain at TWCA could limit excavation; extreme cold at landfill could limit placement of waste.	9 to 10 months. Seasonal limitations: extremely heavy rain at TWCA could limit excavation and solidification; extreme cold at landfill could limit placement of waste.
Implementability				
Technical Feasibility				
- Ability to Construct and Operate Technology	Not difficult to construct or operate.	Technologies not difficult to construct, operate. Exact results of pozzolanic reaction cannot be predicted.	Not applicable.	Exact results of pozzolanic reaction cannot be predicted, but technology is not difficult to construct or operate.
- Ease of Undertaking Additional Remedial Actions	Consistent with probable future aquifer restoration under overall site RI/FS.	Beneficial--removes solids permanently from LRSP area, where future aquifer restoration is probable under overall site RI/FS.	Beneficial--removes solids permanently from site.	Beneficial--removes solids permanently from site.

Table 7
(Continued)

Criteria	Alternative 1 Barrier Wells, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification, Offsite Disposal
- Ability to Monitor Effectiveness of Remedy	Sole remaining pathway is potential migration to groundwater; wells would be monitored.	Sole remaining pathway is potential migration to groundwater in event of landfill failure; wells and leachate would be monitored. Existing groundwater contamination at LRSP will be addressed in overall site RI/FS.	Solids deposited at landfill will be monitored. Existing groundwater contamination at TWCA will be addressed in overall site RI/FS.	See Alternative 6.
- Magnitude of Risk if Monitoring Fails (and exposure pathway goes undetected)	Risk posed by contaminant migration to groundwater will be evaluated during overall site RI/FS.	See Alternative 1. Risk is slight because solids are solidified, landfill is impermeable, leachate collection provided.	Minimal risk if monitoring fails at offsite landfill because of remoteness of site.	See Alternative 6.
Administrative Feasibility	Consult with State Department of Fish and Wildlife if flood protection will require alteration of Truax Creek. Consult with Corps of Engineers if flood protection will significantly alter floodplain. Consult with DEQ to be sure cap satisfies solid waste closure requirements.	Right-of-way of easement needed from Willamette Industries and Burlington Northern Railroad for haul roads between LRSP and the landfill. Consult with DEQ to determine if landfill design satisfies solid waste disposal and closure requirements.	Right-of-way or easement needed from Willamette Industries and Burlington Northern Railroad for haul roads between LRSP and I-5. Consult with DEQ to determine if landfill design satisfies solid waste disposal and closure requirements.	See Alternative 6.
Availability of Necessary Equipment and Specialists				
- Technologies	Technologies are available and have been demonstrated for similar applications.	See Alternative 1.	See Alternative 1.	See Alternative 1.
- Construction	Grading of the LRSP after placing of Schmidt Lake solids will require some expertise by the drag line operator.	Landfill design assumes use of conventional dike construction. Suitable materials are available in vicinity.	Grading of haul roads to I-5 would not pose a problem.	See Alternative 6.
- Equipment	Only conventional equipment will be required.	A system of specialized equipment is required for the solidification treatment plant. Part of the plant will need to be fabricated.	Only conventional equipment required.	See Alternative 5.
- Special Services	A special contractor will be required to install the HDPE liner. Hazardous waste-trained well driller needed for barrier wells.	Special contractors required to install solidification plant and to install HDPE liner.	No special services required.	See Alternative 5.
- Transportation	Dump trucks with tailgate gaskets will be used.	See Alternative 1.	Semitruck-mounted sludge boxes that are water-tight will be used. (Rail transport will be investigated if Alternative 6 or 7 is selected.)	See Alternative 6.
- Offsite Landfilling	Not applicable.	Not applicable.	Available.	Available.

Table 7
(Continued)

Criteria	Alternative 1 Barrier Wells, Capping, Flood Protection	Alternative 5 Removal, Solidification, Onsite Disposal	Alternative 6 Removal, Offsite Disposal As-Is	Alternative 7 Removal, Solidification Offsite Disposal
Costs				
Capital	$1.1 million	$11.3 million	$8.5 million	$10.7 million
Annual O&M	$22,400	$70,700	$0	$0
Future Replacement Costs Average Annual Amount	$9,400	None anticipated.	Not applicable.	Not applicable.
Present Worth				
- At 5 percent, 30 years	$1.6 million	$12.4 million	Same as capital cost.	Same as capital cost.
- At 5 percent, perpetuity	$1.8 million	$12.8 million	Same as capital cost.	Same as capital cost.

from the flood plain, but leaves the sludge in an area where groundwater is high. It would require very careful construction and long-term monitoring to ensure protection of the groundwater.

Alternative 1 leaves the sludge where it is and does not reduce its mobility, though it does offer protection from direct contact and flooding.

2. Compliance with ARARs

The four alternatives would all comply with ARARs; however, some would require more effort than others to comply. Alternatives 6 and 7, for example, involve disposal at landfills already permitted under state regulations, while the onsite landfill required by Alternative 5 would have to undergo inspection and satisfy all substantive permit requirements. Alternatives 1 and 5 would also have to comply with state solid waste regulations for capping and construction. In addition, the greater amount of work at the ponds themselves would be subject to wetlands protection statutes. Alternatives 1 and 5 would require archeological surveys.

3. Long-Term Effectiveness and Permanence

Both Alternatives 6 and 7 would remove the contaminated materials from the site. Long-term maintenance would be the responsibility of the landfill operator or as specified in the applicable state permits and licenses. The solidification aspect of Alternative 7 increases the long-term stability of the sludge.

Alternative 5 is less effective, as it would require O&M on the TWCA site, with higher costs because the groundwater is closer to the surface than at the proposed offsite landfills. Alternative 1 is less effective still, as it leaves the sludges in contact with the groundwater and does not provide any treatment.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

The nature of the sludge makes treatment by reducing toxicity or volume impracticable. However, the solidification treatment performed under Alternatives 5 and 7 would make the contaminants somewhat less mobile.

Alternatives 1 and 6 do not employ any form of treatment.

5. Short-Term Effectiveness

Alternative 1 presents the least risk to onsite workers, as most of the sludge (except that in Schmidt Lake) would be left where it is and the implementation time is fairly short.

The other alternatives all involve moving the sludge and therefore present more opportunities for workers to be exposed to contaminants. In addition, Alternatives 6 and 7 present the possibility of transportation accidents. Alternative 5 would not present this particular problem, but the longer implementation time would mean greater opportunity for exposure.

6. Implementability

None of these alternatives would be difficult to implement. Alternative 6 would be the most easily implemented, as it involves only removal and transportation. Alternative 7 would add solidification, marginally increasing the time and costs involved. Alternative 1 would be more complicated because of the dike and extraction well construction activities. Alternative 5 would be still more complicated because of additional substantive permit requirements for the onsite landfill, as well as construction of the landfill itself.

7. Cost (estimated)

Alternative 1 is the least expensive: $1.1 million capital for construction and $31,800 annually for O&M.

Alternative 6 is next least expensive, at $8.5 million with no O&M. Alternative 7 would have capital costs of $10.7 million; it too requires no O&M.

Alternative 5, the most expensive remedy, has capital cost of $11.3 million and O&M of $70,700 per year.

8. State Acceptance

The Oregon Department of Environmental Quality (DEQ) has been closely involved with the development and review of the RI and FS processes. DEQ commented on the RI/FS, worked with EPA on the Proposed Plan, and attended the public meeting presenting the Proposed Plan to the community. They also reviewed and commented on the draft Record of Decision (ROD), providing updated information on TWCA's compliance history.

The state's letter of concurrence with the remedy is attached as Appendix B.

9. Community Acceptance

Community members who commented on the Proposed Plan favored Alternative 7. Most agreed that it had the highest level of environmental protection; some felt it was higher than necessary but hoped that this remedy would satisfy community concerns about the site. Some commentors had concerns about the landfilling component of this alternative but preferred it to other options. The most frequent concern voiced by local residents and officials was that the matter should be settled and controversy ended.

The next most popular alternative was number 1, which was seen as providing sufficient environmental protection at a much more reasonable cost. However, those preferring this alternative had no serious objections to number 7. Neither of the other alternatives was preferred by any commenter.

The attached Responsiveness Summary (Appendix A) provides a complete summary of public comments received during the comment period.

THE SELECTED REMEDY

Based upon consideration for the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, both the EPA and the state of Oregon have determined that Alternative 7 (removal, solidification, and offsite disposal) is the most appropriate remedy for Operable Unit #1 at the TWCA site. It has been selected because it consistently ranked among the best choices under all the ranking criteria except cost. It effectively reduces the likelihood of contact with the sludges and ensures that contaminants are not transported into groundwater, surface water or air. Human health and environmental risks associated with the identified routes of exposure will be eliminated or controlled by this remedial action.

Approximately 85,000 cubic yards of sludge will be excavated from the LRSP and Schmidt Lake. The sludge will be mixed with a solidification agent such as Portland cement. This will improve handling characteristics, reduce mobility of contaminants, and increase the structural strength for landfilling and capping. The mixture will then be transported to an offsite permitted solid waste disposal site. The mixture would be placed in a separate monocell (adequately protected from coming into contact with other wastes) and capped in accordance with state and local disposal requirements, applicable permit conditions, and EPA approval. The sludge mixture can be taken to a solid waste landfill because it is not a RCRA hazardous waste. The monocell must have a liner and a leachate control system. This Interim Action, including the removal and relocation of the sludges, is scheduled to be completed within three years of the signing of the Consent Decree.

The sludge relocation removes all of the sludge materials from Schmidt Lake and the LRSP, both areas which could be impacted by a one in 500 year flood. The sludge material must go to a permitted solid waste disposal facility which by definition cannot be in a floodplain. No location or facility is specified by this ROD, but two facilities were identified in the FS which meet the state requirements for a disposal facility. There are also out of state permitted landfill disposal facilities available.

The disposal facility must not comingle the TWCA waste sludge materials with any other waste; i.e., it must be a monofill. This is to facilitate compliance with any monitoring requirements that may differ from those for other wastes. A suitable cap must be placed which prevents sludge exposure to people or the environment outside of the disposal unit. The cap must also protect people from the release of radon contained or created from contaminants in the sludge.

A treatment step is part of this remedy. Prior to relocation in the permitted landfill, the sludges will undergo partial treatment by using a solidification agent like Portland cement. The object of this partial solidification treatment process is to reduce the free water content of the sludges, make the sludges easier to handle using conventional equipment, and reduce the mobility of contaminants by chemical and physical processes. Although this treatment process will not make the sludges into rigid solids, it will improve the final handling characteristics and provide a level of treatment to the sludge materials. The FS identified onsite treatment as part of the recommended alternative. Offsite treatment (e.g., at the disposal facility) may be considered during the design phase, if EPA can be assured it will be performed in accordance with CERCLA and meet ARARS.

The risk reduction by this Interim Action is from an estimated 3 excess cancers in a population of 1000 without any future control actions (assuming an extreme residential use scenario of the actual sludge pond area) to acceptable risk levels of less than 1 excess cancer in a population of 1 million by permanently removing the routes of exposure. Additional environmental risk assessment data is being developed during the overall site investigation. Because the existing sludge ponds are unlined, there is a future risk of contaminated groundwater being exposed to the environment. Relocation of the sludges reduces this risk.

Long term monitoring of the solidified wastes is required and may be the responsibility of the permitted landfill facility. Monitoring and management of the facility are specified in the applicable permit and state laws. EPA must approve the use of any disposal site prior to its accepting the TWCA sludge material.

The estimated cost of the remedy is $10.7 million. The major cost elements as presented in the FS are listed below:

Sludge removal and hauling	$ 590,000
Solidification treatment process	1,586,000
Offsite disposal	6,000,000
Engineering design, bids, contingencies, etc.	2,540,000
Total Costs	$ 10,716,000

The long-term O&M costs, including monitoring, are included as part of the offsite disposal cost. O&M and monitoring are the responsibility of the disposal facility. The cost estimates may change based on final engineering, design, disposal costs, etc. This decision does not specify the treatment process, disposal site or engineering designs. These activities are part of the design phase of this action which occurs during the ROD implementation process.

Performance standards for the ROD include the ARARs for excavation, treatment, transportation, and disposal processes. Partial treatment of the sludge material is required to reduce the water content, to improve handling characteristics, and to reduce contaminant mobility. The degree of solidification will be determined during the design phase. Special landfill cap requirements to prevent radiation release are necessary (4' of cover material plus 1' of clay). Long-term monitoring of any disposal site selected must be consistent with the state of Oregon's minimum requirements.

THE STATUTORY DETERMINATIONS

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment by removing the sludge from the floodplain, eliminating it as a source of onsite groundwater contamination, and placing the material at a site where there will be minimal exposure to it by any pathway. The sludge will be mixed with a solidifying agent to reduce contaminant mobility. Special design features (composite liners, leachate collection, and detection monitoring) will control the migration of contaminants to groundwater at any approved proposed disposal facility. A cap will be placed over the material in accordance with state permit requirements, reducing possible exposure to radon or contaminated dust. Specifically, radon-226 will decay to solid particles before reaching the surface if contained under a cover of approximately five feet of normal soil, or less for compacted clay. A minimum of four feet of final cover, including at least one foot of clay material, would be required at the offsite disposal facilities under consideration.

The proposed offsite disposal facilities will provide protection from exposure to the sludges by dermal contact, ingestion, and inhalation. The sites being considered in Oregon are located in relatively unpopulated areas, with low average precipitation and a minimum of 100 feet depth to groundwater. Should the sludge be disposed in another state, EPA would, regardless of that state's permitting requirements, stipulate that disposal be in a solid waste facility that meets RCRA Subtitle D requirements and includes the following features: monocell, cap, liner, and long-term monitoring.

Compliance with ARARs

The selected remedy of excavation, solidification, and offsite disposal will comply with all applicable or relevant and appropriate chemical-specific, action-specific, and location-specific requirements (ARARs). These are listed below. This analysis does not include ARARs that might apply in states other than Oregon.

Action-specific ARARs:

1. Clean Air Act requirements (40 CFR 50-99) for control of dusts during excavation activities. In addition, the Oregon DEQ regulates emissions of hazardous air pollutants (including beryllium and mercury, two contaminants of concern identified in the sludge) under OAR 340-25-470 and 340-25-480.

2. Oregon Solid Waste Regulations (OAR 340-61), which address the siting, construction and operation of solid waste disposal facilities in the state of Oregon.

3. Occupational Safety and Health Act (29 CFR 1910) requirements for worker protection training and monitoring during remedial action.

4. Oregon State Health Division Requirements (OAR 333-104), which provide standards for protection from radiation hazards.

5. Oregon Environmental Cleanup Rules (OAR 340-122-090), which include requirements to restore the environment to levels of contamination that are equal to background or protective of public health and the environment.

6. Oregon Public Utility Commission Rules, which regulate commercial transportation, including transportation of solid waste.

Chemical-specific ARARs:

1. Clean Water Act requirements for discharges under NPDES permits, which regulate the water removed from the sludges to be treated at the existing TWCA wastewater treatment plant.

   There are currently no chemical-specific ARARs for sludges or solids.

Location-specific ARARs:

1. Executive Order 11988, Protection of Floodplains (40 CFR 6, Appendix A)

2. Executive Order 11990, Protection of Wetlands, which requires that actions minimize the destruction, loss, or degradation of wetlands.

3. National Archeological and Historical Preservation Act, which requires action to recover or preserve artifacts for construction on previously undisturbed ground.

Other Criteria, Advisories or Guidance To Be Considered for the Selected Remedial Action (TBCs):

1. U.S. Regulatory Commission's policy statement on below-regulatory-concern radioactive material (December 12, 1988, Federal Register) was included as criteria considered in evaluating the proposed disposal options.

Cost Effectiveness

The estimated cost to implement the selected remedy is $10.7 million, which was in the middle range of the final alternatives evaluated for this operable unit. This is within an order of magnitude of the costs associated with the least costly alternative (Alternative 1) and requires very low operation and maintenance. It offers several advantages by removing a source of groundwater contamination and providing a much higher degree of certainty that future risks associated with various pathway exposure will be minimized by partially solidifying the sludges and relocating them to a facility designed and permitted for disposal of such wastes.

Land Disposal Restrictions

The selected remedy does not require the placement of any RCRA hazardous wastes either on or offsite. Therefore, the Land Disposal Restrictions do not apply.

Utilization of Permanent Solutions and Alternative Treatment Technolcgies or Resource Recovery Technologies to the Maximum Extent Practicable

EPA and the state of Oregon have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner. The sludge will be partially solidified to reduce contaminant mobility. The nature of the sludge material (low permeability, insoluble contaminants, low organic content) made it impractical to apply other treatment technology process options that were considered in the initial screening of alternatives. In addition, the treatment options that included further dewatering of the sludge were screened out because of concern over increased dust and radon exposure.

The two permitted offsite disposal facilities identified in the FS would need to provide long term assurance that risks associated with contaminant migration will be minimal. Institutional controls (solid waste disposal permit requirements) will ensure that the sludge mixture will continue to be isolated from the surrounding environment.

Preference for Treatment to Reduce Toxicity, Mobility, or Volume as a Principal Element

The partial solidification proposed in the preferred alternative will help reduce the risk of migration of contaminants to groundwater, increase the strength of the material for landfilling and capping, and provide some reduction of radon release.

As indicated above, the nature of the sludge makes treatment by reducing toxicity or volume impractical. A number of treatment technologies were initially evaluated and screened out for this operable unit.

The FS for the overall TWCA site will evaluate alternatives for reducing toxicity, mobility, and volume of contaminants that are identified in the ongoing RI. The statutory preference for treatment as a principal element of the overall site cleanup will be addressed by the final ROD for this site.

APPENDICES

RECORD OF DECISION
TELEDYNE WAH CHANG ALBANY
OPERABLE UNIT #1
ALBANY, OREGON

Appendix A: Responsiveness Summary

Appendix B: State Letter of Concurrence

Appendix C: Administrative Record Index

December 1989

RESPONSIVENESS SUMMARY
TELEDYNE WAH CHANG ALBANY
OPERABLE UNIT #1 INTERIM ACTION

Overview

The Teledyne Wah Chang Albany (TWCA) facility is located in Millersburg, Oregon (about 3 miles north of Albany) in the Willamette Valley of western Oregon. The TWCA Superfund site includes a 110 acre plant site property and the 115 acre facility known as the "farm site". The entire facility was placed on the Environmental Protection Agency's (EPA) National Priorities List (NPL) in 1983. A Remedial Investigation and Feasibility Study (RI/FS) is underway for the entire facility. This responsiveness summary addresses public comments made regarding a proposed Interim Action at the facility.

This Interim Action addresses cleanup of the Lower River Solids Pond (LRSP) and Schmidt Lake which are unlined surface impoundments that previously received process wastewater from the various operations at the site.

The facility has been operating since 1956 when the Wah Chang Corporation began operation of the U.S. Bureau of Mines Zirconium Metal Sponge Pilot Plant. New facilities have been added at the site which now include the production of zirconium and hafnium-sponge from zircon sands, melting and fabrication operations and facilities for the production of other speciality metals. Solids generated from the process wastewater treatment system have been stored in a number of surface impoundments; including the and Schmidt Lake prior to 1980.

Since 1980 wastewater sludges have been stored in the farm ponds which were originally part of this Interim Action, but will be addressed under the investigation of the entire facility. The TWCA sludges have been the subject of several ballot initiatives, regulatory control processes, and environmental group attention since the early 1980's primarily because of the small amounts of radioactive materials and the location of two of the ponds in the floodplain of the Willamette River. In 1979, TWCA modified their production process to significantly reduce the concentration of radioactive compounds in their wastewater sludges.

In May 1987 TWCA signed an agreement (Consent Order) with EPA to investigate the nature and extent of the contamination problems at the facility and develop alternatives for cleanup where necessary. This work is called a Remedial Investigation and Feasibility Study and is currently underway. As part of this Order, EPA and TWCA agreed to address the LRSP, Schmidt Lake, and Farm Pond sludges prior to completion of the RI/FS for the entire facility. This action was due to concern over the sludges potential contribution to groundwater contamination, public concern over the materials, and their location in the floodplain.

Although the Farm Ponds were part of this investigation, they will be addressed in the RI/FS for the remainder of the site and will be cleaned up if necessary.

On August 16, 1989 EPA's published it's preferred alternative for cleanup of the two sludge ponds in a document called a Proposed Plan. The Proposed Plan as well as the reports of the investigation of the sludges were released for public comment. EPA's preferred alternative included:

- Removal of the sludges from the LRSP and Schmidt Lake,
- Solidification of the sludges by adding Portland cement to improve handling characteristics and to reduce contaminant mobility; and
- Relocation of the mixture to a permitted offsite disposal facility.

Background on Community Involvement and Concerns

As described above, the sludges have been the subject of ballot initiatives, regulatory control processes and concern by environmental groups. Local residents, state legislators, city (Albany and Millersburg) officials, and the media have all expressed interest in the TWCA sludges over the years. Recently, local officials have expressed their support for TWCA and EPA's Proposed Plan.

Environmental activists affiliated with statewide or national organizations have been particularly involved in the activities related to the TWCA sludges. By far the most vocal of these has been Forelaws on Board of Portland, Oregon, which has been involved in sponsoring three ballot measures aimed at insuring the sludge pond wastes are removed from the floodplain and treated as low-level nuclear wastes. Greenpeace has also been interested in TWCA sludges and staged two protests in 1985.

Overall, community concerns centered around the sludges' location in the floodplain, the low level radioactive nature of the sludges, and the potential for groundwater contamination from the unlined storage ponds.

A list of community relations activities conducted by EPA can be found at the end of this summary.

Summary of Comments Received

EPA held a public comment period from August 18, to September 16, 1989, which was extended to October 16, 1989, upon the request of a commentor. Comments and questions raised during the public comment period on the Proposed Plan for Operable Unit #1 of the TWCA site are summarized below and are grouped by category.

As part of the public comment period a public meeting was held on September 6, 1989, at Linn Benton Community College in Albany, Oregon. About 20 people attended the meeting and ten people gave comments. Comments given at this meeting are included in the following summary. The meeting consisted of presentations by EPA staff and CH_2M Hill (TWCA contractors) followed by a question and answer period, and public comments.

Copies of the transcript from the meeting are available at the Albany Public Library, Albany and Millersburg City Halls, EPA's Seattle office and the Portland office of the Department of Environmental Quality (DEQ).

RESPONSIVENESS SUMMARY

Superfund Process and Policy

The following comments were made about the process used to arrive at the preferred alternative.

Comment: One commentor was concerned about separating the sludges as an operable unit from the rest of the site. The commentor was concerned about information that is to be developed in the future (during the overall site RI/FS) that may impact the decision now being made for the sludges.

Response: EPA's Proposed Plan for the sludge ponds was selected while considering future long term options. EPA believes the action will be consistent with future actions; however, it will be reviewed for consistency as part of the overall site RI/FS.

Comment: One commentor expressed concern that the sludge issues were not only of concern locally but that individuals state-wide have been interested. The commentor suggested that additional public meetings be held in Salem and Portland.

Response: CERCLA §117(a)(2) provides for an opportunity for public meetings on the Proposed Plan to be held "at or near the facility at issue". Although this does not preclude holding additional meetings elsewhere, EPA believes that the meeting was widely publicized offering an opportunity for anyone to attend. The meeting was primarily publicized through the fact sheet which was sent to all individuals who had previously been interested including individuals outside the Albany area. A notice of the meeting was also published in the newspaper. EPA extended the public comment period for an additional 30 days, during which time no additional requests for public meetings in other locations were received.

Comment: One commentor stated that further evaluation should be conducted to determine how each alternative would impact future cleanup activities that may be needed at the site.

Response: This type of evaluation will be part of the overall site RI/FS.

Comment: One commentor suggested that the radiological analyses have all been done by TWCA and that independent sampling and laboratory testing should be done.

Response: EPA contractors have provided oversight for all RI/FS sampling, and analyses of samples has been done with EPA approved methods. EPA has obtained split samples and has analyzed them independently from TWCA labs as part of the oversight. EPA also does quality assurance reviews of all data to insure they meet agency standards, and is satisfied with the quality of the data from the TWCA site.

The split samples for radiological analysis were analyzed by the Oregon Health Division laboratory. The EPA radiation office has also reviewed the radiation oversight program.

The Preferred Alternative

Comment: Several state and local officials, a union leader, and a local newspaper publisher volunteered their support for TWCA and for an expeditious cleanup of the sludges. They hope this will end the years of controversy over the site.

Response: Comment noted.

Comment: One commentor expressed disagreement with screening out Alternative 1, which would cap the sludges in place. He stated that the preferred alternative assumes a greater risk than is actually present, and that public disapproval is not a legitimate reason for discounting an alternative. He further stated that such a lower cost remedy would be sufficiently protective.

Response: The risks to public health and the environment are judged to be higher under Alternative 1 than Alternative 7, because Alternative 1 does not reduce the mobility of the contaminants, and groundwater is adversely effected. Also, Alternative 1 requires long-term maintenance of dikes, and groundwater pumping and treatment. Therefore its long-term effectiveness is less certain than Alternative 7.

Comment: A local official noted that preference for Alternative 7 seems to be based partly on the reduction of risk that would result from removing the sludges from the floodplain. However, the commentor noted that it appears there is no evidence that a flood which dispersed the sludges would cause detectable contamination downstream.

Response: EPA considered several factors in its support for Alternative 7 including: removing a potential source of groundwater contamination as the ponds are unlined; and reducing potential human contact with the sludges. Although the risk of dispersal of the sludges through flooding is of concern, the risks resulting from such dispersal cannot be quantified. Because of this uncertainty, Alternative 1 is considered less effective in protecting the environment than other alternatives which remove the sludges from the floodplain.

Comment: One commentor believed that the sludge materials should not be placed in a municipal landfill and that special attention should be given to their disposal.

Response: EPA and Oregon DEQ have determined that the sludges are not "Hazardous Waste" as defined by law. Accordingly, there is no regulatory basis for requiring that the material go to other than an approved solid waste disposal site. However, EPA is requiring that the sludges be placed in a separate area isolated from other wastes (monocell). Also, the monocell must be lined, capped, and regularly monitored.

Comment: Two commentors, who both identified themselves as environmental activists, are concerned that the sludges will be mixed with other wastes when they are disposed in a landfill. They felt that these wastes deserve special attention because they are radioactive.

Response: The sludges would be placed in their own separate cell from other landfill wastes. Radioactivity levels of the sludges are below regulated levels and the landfill cap, which is required as part of the relocation to a permitted landfill, would reduce exposure to the contaminants.

Comment: One commentor indicated that the sludges should be capped with an impermeable cap once placed in the landfill.

Response: A suitable cap will be placed over the waste to reduce exposure to the sludge. The permits for the landfills under consideration contain specific requirements for soil compaction and the permeability of the cap material, which prevents or minimizes the infiltration of rainwater into the fill. The exact design of the cap will be determined during the Remedial Design phase of the project, following the issuance of a Record of Decision.

Supplemental Risk Assessment

The following comments were made about the supplemental risk assessment prepared by EPA. The results of the supplemental assessment were presented at the September 6 public meeting and were published in a document in September 1989 which is available at the information repositories previously mentioned.

Comment: One commentor expressed concern during the public meeting that a full analysis of the risk assessment had not been completed by EPA. The commentor felt that because a written summary was not available at the public meeting, this indicated EPA was not finished with its analysis.

Response: EPA had concluded its further analysis of the risk assessment and had completed a supplemental assessment at the time of the September 6, 1989, public meeting. The final analysis was presented at the meeting, however because written documentation was not available at the time of the meeting, EPA extended the public comment period to October 16, 1989, to allow time for public review and comment on its supplemental risk assessment. This extension was at the request of the commentor.

Comment: A local official commented that EPA used too many assumptions in its supplemental risk assessment that were far from actual existing scenarios.

Response: In order to be protective of public health and the environment over the long term, EPA must look at all possible future uses of a site. Although some of the scenarios used do not exist today, EPA also attempts to protect against future adverse impacts a site may have on public health or the environment.

Comment: Teledyne Wah Chang commented that a risk assessment based on no action was not required as part of the work plan agreed upon between EPA and TWCA. They further commented that a no action alternative was not appropriate.

Response: Although EPA agreed that TWCA did not have to consider a "no action alternative" for the sludges, upon receiving the final reports developed by TWCA and its consultants, EPA felt information on the potential risks if no action were taken was needed to help determine the best course of action. Because EPA had agreed that TWCA need not conduct such analyses, EPA elected to conduct the additional work.

Comment: TWCA indicated that chromium values from the RI were based on total chromium. TWCA commented that assuming that all of the chrome was chrome VI for the supplement risk assessment was inaccurate.

Response: For clarification of the measurements of chromium at the facility see the "Teledyne Wah Chang Albany Endangerment Assessment". Total chromium was measured in sludges from the ponds. Since the type of chromium was not specified, EPA assumed for its supplemental risk assessment that the most toxic form (chromium VI) was present in order to be more protective of public health.

Comment: TWCA commented on the reference "Personal Communication" used to reference a dose conversion factor in the supplement assessment. They felt that using such a reference was insufficient.

Response: References such as "Personal Communication" are used in the risk assessment because at this time certain parameters can only be determined based on best professional judgement.

Comment: TWCA clarified that ambient air modeling of concentrations of the pond solids was performed. TWCA indicated that the results of the modeling showed that the radioactive particulate concentrations averaged 23.5 ug/m^3 for the LRSP and 16 ug/m3 for Schmidt Lake. They indicated that these values were well below the value used in the TWCA endangerment assessment.

Response: EPA was not aware of the modeling described in TWCA's comments. The information provided to EPA by TWCA in their endangerment assessment indicated that ambient air concentrations were based on theoretical levels rather than concentrations predicted through modeling. To maintain consistency with the exposure assumptions used by Teledyne Wah Chang in their endangerment assessment, EPA used the same theoretical concentrations.

Comment: TWCA commented that in conducting the endangerment assessment it used engineering judgement and EPA guidance as well as estimated risks which were likely rather than "extreme". TWCA indicated that its opinion is that estimating risks which are very unlikely (extreme) exposure scenarios provide little or no decision making value unless the actual results show low risk.

Response: EPA finds value in evaluating all possibilities in order to be protective. This allows for a higher degree of confidence and a wider margin of safety in risk management decisions.

Other Concerns

Comment: An environmentalist commented that a careful analysis should be conducted of sludge deposited by TWCA on agricultural fields near the TWCA site.

Response: These fields are currently considered to be outside the boundaries of the TWCA site and thus beyond the scope of this Interim Action. However, further evaluation will be done to determine whether these fields would be appropriately considered as part of the overall site RI/FS. Currently responsibility for this issue belongs to the state of Oregon and this comment has been passed on to DEQ.

Comment: An environmental consultant had specific questions about the process for solidifying the sludges and the requirements for a bidder to bid on the work. Specifically the questions were as follows:

1) Can the Portland cement or other approved material be added to the sludge at the point of delivery (as opposed to on site before transportation)?

Response: Although EPA's proposal called for solidification before transportation, a final decision will be made during "Remedial Design" at which time all of the specific processes will be outlined. The location of an offsite treatment process would have to be as protective to health and the environment as an onsite system to be considered.

2) Would EPA permit a bidder to make a fully loaded 600-mile test run of a specifically designed transport vehicle?

Response: More details would need to be provided but nothing precludes tests to be made prior to final design.

3) Would EPA permit a bidder to use an approved water reduction process in order to reduce the weight of the sludge as well as increase its stiffness?

Response: The action of the solidification process is two-fold: improving the sludge handling characteristics and binding contaminants to reduce migration. The methods for achieving these properties are not specified in the Record of Decision. However, the RI/FS raised concerns about reducing the water content of the sludges because of increased risk of releasing radon.

4) What is the purpose of requiring Portland cement, and can this step be eliminated?

Response: See above. Tests performed on the sludges using Portland cement did improve handling characteristics and improved the binding characteristics of the contaminants.

Attachment

COMMUNITY RELATIONS ACTIVITIES

The following EPA community relations activities have been conducted at TWCA under Superfund:

- December 1982 - site proposed for inclusion on the National Priorities List (NPL).
- October 1983 - site listed on NPL.
- February-May 1987 - local citizens and officials interviewed in order to prepare a Community Relations Plan.
- November 1987 - final Community Relations Plan issued.
- November 1987 - Information Repositories established at Albany Public Library, DEQ (Portland), and EPA Region 10 (Seattle).
- November 1988 - RI/FS work plan for entire facility sent out for 30-day public comment period. Work plan was placed in information repositories and a fact sheet was published.
- February 1989 - Fact sheet published announcing EPA's approval of the final work plan.
- June 1989 - Fact sheet published announcing that TWCA had submitted a draft RI/FS report to EPA for Operable Unit #1.
- August 16, 1989 - Interim Action (Operable Unit #1) Proposed Plan published.
- August 18 - October 16, 1989 - Public comment period for the Interim Action Proposed Plan.
- September 6, 1989 - Public meeting for the Operable Unit #1, Proposed Plan, held in Albany. This meeting was announced in the Proposed Plan and a local newspaper.

APPENDIX B

NEIL GOLDSCHMIDT
GOVERNOR

Department of Environmental Quality

811 SW SIXTH AVENUE, PORTLAND, OREGON 97204-1390 PHONE (503) 229-5696

DEC 20 1989

Mr. Robie G. Russell
Regional Administrator
U. S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Re: Teledyne Wah Chang Albany
Record of Decision

Dear Mr. Russell:

The Oregon Department of Environmental Quality (DEQ) has reviewed the draft Record of Decision, for Operable Unit Number One (sludges), at the Teledyne Wah Chang Albany (TWCA) Superfund site. DEQ concurs with EPA's selected remedy (i.e., removal, solidification, and off-site disposal), with the following condition:

> If the sludges are to be sent to a disposal site in Oregon, the disposal site must hold a valid Solid Waste Disposal Permit or Hazardous Waste Disposal Site Permit, issued by the DEQ, and must obtain specific written approval from the DEQ to accept these wastes.

I find that this alternative provides the best balance of protectiveness, cost effectiveness, and the use of alternative treatment technologies, as required by ORS 466.573.

I am pleased that DEQ, EPA, and TWCA have reached agreement on this issue. As you know, the presence of these sludges in the floodplain of the Willamette River has been a concern to many Oregonians. I look forward to the swift implementation of the selected remedy and to continued good working relationships with EPA and TWCA on the investigation and cleanup of the remainder of the site.

Sincerely,

Fred Hansen
Director

WD:m
Site\SM2672
cc: Neil Thompson, EPA
Al Goodman, EPA, OOO
Mike Downs, ECD, DEQ
Steve Greenwood, HSW, DEQ

APPENDIX C

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

ADMINISTRATIVE RECORD INDEX

for

TELEDYNE WAH CHANG ALBANY SUPERFUND SITE

Albany, Oregon

October 13, 1989

INDEX TO ADMINISTRATIVE RECORD FOR TELEDYNE WAH CHANG ALBANY

SECTION 1.0 SITE IDENTIFICATION

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
1.1 Correspondence							
AR 1.1 0001	1.1 Correspondence	Letter/Preliminary evaluation of radiological aspects of plant operations	5/17/77	2	William Young, Director/ Oregon Department of Environmental Quality (DEQ) and Keith Putman, Administrator/Oregon Sate Health Division (OSHD)	Vincent de Poix, President/Teledyne Wah Chang-Albany (TWCA)	
AR 1.1 0002	1.1 Correspondence	Notes/Discussion with Ted Groszkiewicz from DEQ regarding disposal pits, lagoons, and ponds	5/13/80	3	Bob Stamnes/Ecology and Environment, Inc.	Files	
AR 1.1 0003	1.1 Correspondence	Letter/Sampling of the Willamette River and Conser Slough with attached maps and notes	6/30/81	11	Karen Weliky, Mitchell Lyle, Jack Dymond, and Bill Rugh/Oregon State University	David Stewart-Smith and George Toombs/OSHD	
AR 1.1 0004	1.1 Correspondence	Memorandum/Status report on TWCA as controlled vs. uncontrolled hazardous waste site	11/23/81	9	Hussein Aldis/Ecology and Environment, Inc.	Bill Schmidt/Ecology and Environment, Inc.	
AR 1.1 0005	1.1 Correspondence	Memorandum/Review of status report on TWCA as controlled vs. uncontrolled hazardous waste site	12/02/81	2	Carolyn Wilson/Ecology and Environment, Inc.	J.E. Osborn/Ecology and Environmenta, Inc.	
AR 1.1 0006	1.1 Correspondence	Memorandum/Possible EPA involvement	12/7/81	1	Hussein Aldis/Ecology and Environment, Inc.	Bill Schmidt/Ecology and Environment, Inc.	
AR 1.1 0007	1.1 Correspondence	Background memorandum	9/19/82	3	Unknown	Unknown	
AR 1.1 0008	1.1 Correspondence	Notes/Sampling at sludge ponds	9/27/82	3	Unknown	Unknown	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 1.1 0009	1.1 Correspondence	Memorandum/Samples taken at Lower River Sludge Pond on 4/29/79 with attached sample map	9/28/82	2	T.E. Nelson, Manager-Environmental Quality/TWCA	Robert Poss/EPA, Region X	
AR 1.1 0010	1.1 Correspondence	Memorandum/Identification of waste streams from TWCA	11/18/82	1	Mark Hooper/EPA, Region X	Robert Poss/EPA	
AR 1.1 0011	1.1 Correspondence	Memorandum/Building constructed over old TWCA landfill	2/11/83	1	Neil Thompson/EPA, Region X	Files/EPA, Region X	
AR 1.1 0012	1.1 Correspondence	Memorandum/Review of current monitoring program for groundwater protection at Farm Pond site with attached diagrams and sampling data	7/12/83	8	Stan Sturges/Water Quality Division-State of Oregon	JEB, DSL, and Files/Water Quality Division-State of Oregon	
AR 1.1 0013	1.1 Correspondence	Transmittal letter/Attached technical assistance team (TAT) review regarding TWCA as National Priority List (NPL) site	9/6/83	6	Thomas Johnson, TAT Leader/Weston Sper	James Willman/EPA, Region X	
AR 1.1 0014	1.1 Correspondence	Notes/Background information and current actions	9/19 and 9/20	7	Unknown	Unknown	
1.2 Historical Summary							
AR 1.2 0001	1.2 Historical Summary	Report/Historical summary of Oregon laws applicable to TWCA and legal actions taken against TWCA with attached copies of Oregon laws, initiatives, letter from EPA to TWCA, and three letters from TWCA to EPA regarding report entitled "Preliminary Engineering Report on Permanent Lime Solids Containment for TWCA" and Order on Consent	Unknown	18	Unknown	Unknown	
1.3 Site Investigation Report							
AR 1.3 0001	1.3 Site Investigation Report	Investigation Report/Abandoned hazardous waste site program	8/15/79	3	Neil Thompson and Al Goodman/EPA, Ted Groszkiewicz/DEQ, and Tom Nelson and Gerald Sing/TWCA	EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
1.4 Site Inspection Reports							
AR 1.4 0001	1.4 Site Inspection Reports	Potential hazardous waste site report	7/15/80	14	Hussein Aldis/Ecology and Environment, Inc.	EPA, Region X	
AR 1.4 0002	1.4 Site Inspection Reports	Memorandums/Magnesium chloride wastes and site inspection report with attached maps, memorandum regarding ammonia seepage, and potential hazardous waste site inspection report	7/16 and 22/80	23	Hussein Aldis/Ecology and Environment, Inc.	Bob Stamnes/Ecology and Environment, Inc.	
AR 1.4 0003	1.4 Site Inspection Reports	Potential hazardous waste site report	8/30/82	11	Hussein Aldis/Ecology and Environment, Inc.	EPA, Region X	
1.5 Sampling Data							
AR 1.5 0001	1.5 Sampling Data	Sampling sites for radiation monitoring at plant	4/26/79	1	EPA	EPA	
AR 1.5 0002	1.5 Sampling Data	Groundwater and sludge sampling data with attached maps, memorandums, and zirconium manufacturing sequence fact sheet	7/28/82	22	Unknown	Unknown	
AR 1.5 0003	1.5 Sampling Data	Heavy metals sampling data	10/11/82	1	Thomas Nelson/TWCA	Neil Thompson/EPA	
AR 1.5 0004	1.5 Sampling Data	Memorandum/Chemical wastes at TWCA with attached groundwater sampling data and memorandum regarding sludge sampling	2/7/83	4	Hussein Aldis/Ecology and Environment, Inc.	John Osborn/Ecology and Environment, Inc.	
AR 1.5 0005	1.5 Sampling Data	Memorandum/Waste discharge and sludge pond sampling data with attached maps	2/22/83	7	Hussein Aldis/Ecology and Environment, Inc.	John Osborn/Ecology and Environment, Inc.	
AR 1.5 0006	1.5 Sampling Data	Memorandum/Analytical results for heavy metals in groundwater samples and attached sampling data	1/30/86	59	Thomas Nelson/TWCA	Neil Thompson/EPA	
1.6 Preliminary Assessment Reports							

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 1.6 0001	1.6 Preliminary Assessment Reports	Potential hazardous waste site log	8/79	1	J.W. Fey/EPA, Region X	EPA, Region X	
AR 1.6 0002	1.6 Preliminary Assessment Reports	Evaluation of Section 311 cleanup requirements	2/25/80	1	R. Fullner/Ecology and Environment, Inc.	EPA, Region X	
AR 1.6 0003	1.6 Preliminary Assessment Reports	Potential hazardous waste site tentative disposition/Pyrophoric materials	2/29/80	2	Robert Stamnes/Ecology and Environment, Inc.	EPA, Region X	
AR 1.6 0004	1.6 Preliminary Assessment Reports	Potential hazardous waste site tentative disposition/Dike integrity	5/30/80	2	Robert Stamnes/Ecology and Environment, Inc.	EPA, Region X	
AR 1.6 0005	1.6 Preliminary Assessment Reports	Potential hazardous waste site identification with attached letter from Corps of Engineers regarding hazardous waste disposal sites on their property	9/2/86	2	EPA	EPA, Region X	
AR 1.6 0006	1.6 Preliminary Assessment Reports	Potential hazardous waste site identification with attached memorandum regarding pond accessible to public, maps, and photographs	5/7/87	7	Tom Robertson/EPA, Region X	EPA, Region X	
AR 1.6 0007	1.6 Preliminary Assessment Reports	Potential hazardous waste site identification and preliminary assessment	Unknown	4	EPA, Region X	EPA, Region X	

SECTION 2.0 ENVIRONMENTAL PROGRAMS - BACKGROUND

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
2.1 *National Pollution Discharge Elimination System (NPDES)*							
	2.1.1 Correspondence						
AR 2.1.1 0001	2.1.1 Correspondence	Letter/EPA approval of proposed permit	10/26/78	1	Donald Dubois, Regional Administrator/EPA, Region X	William Young, Director/Oregon Department of Environmental Quality (DEQ)	
AR 2.1.1 0002	2.1.1 Correspondence	Memorandum/Draft renewal permit	10/27/78	6	Director/Environmental Quality Commission	Environmental Quality Commission	
AR 2.1.1 0003	2.1.1 Correspondence	Transmittal memorandum/Final permit	11/78	1	Alan Goodman/Oregon Operations Office-EPA	Harold Geren/EPA, Region X	
AR 2.1.1 0004	2.1.1 Correspondence	Letter/Request for hearing to contest certain conditions and limitations imposed by the Environmental Quality Commission on the NPDES permit	11/16/78	1	V.P. de Poix, President/ Teledyne Wah Chang-Albany (TWCA)	William Young/DEQ	
AR 2.1.1 0005	2.1.1 Correspondence	Letter/Processing and issuance of permit with attached letters from Friends of the Earth and DEQ regarding issuance of permit	11/22/78	7	Lloyd Reed, Enforcement Director/EPA, Region X	Gil Zemansky/Friends of the Earth	
AR 2.1.1 0006	2.1.1 Correspondence	Letter/Preparation for hearing requested by TWCA regarding permit limits with attached letter from TWCA attorneys regarding their position on permit limits and sampling data	4/10/79	11	Charles Ashbaker/DEQ	John Vlastelicia/Oregon Operations Office-EPA	
AR 2.1.1 0007	2.1.1 Correspondence	Letter/EPA review of TWCA position on permit limits with attached memorandum with comments from industrial waste consultant E.J. Struzeski	5/24/79	3	John Vlastelicia/Oregon Operations Office-EPA, Region X	Charles Ashbaker/DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.1 0008	2.1.1 Correspondence	Letter/NPDES monitoring reports	3/20/87	1	Richard Parkin/EPA, Region X	TWCA	
AR 2.1.1 0009	2.1.1 Correspondence	Transmittal letter/Supply of 1988 monitoring reports	1/7/88	2	Richard Parkin/EPA	TWCA	
AR 2.1.1 0010	2.1.1 Correspondence	Notes/Changes in permit by Environmental Quality Commission	Unknown	3	Dennis Stefani/Unknown	Unknown	
	2.1.2 Sampling Data						
AR 2.1.2 0001	2.1.2 Sampling Data	Memorandums/Analytical results for effluent sampling with attached sampling data	9/27/79	29	Edmund Struzeski/National Enforcement Investigations Center (NEIC)-EPA	Al Goodman/Oregon Operations Office-EPA	
AR 2.1.2 0002	2.1.2 Sampling Data	Bioassay results on effluent	1/2-4/80	3	TWCA	TWCA	
AR 2.1.2 0003	2.1.2 Sampling Data	Memorandum/Sludge dewatering lagoons monitoring with attached sampling data	2/7/80	2	Charles Knoll/TWCA	Ted Groszkiewicz/DEQ	
AR 2.1.2 0004	2.1.2 Sampling Data	Memorandum/Results of toxicity bioassay and mixing zone survey to evaluate effluent upon receiving stream	10/6/82	12	Gerald Bell/DEQ	Please see document	
AR 2.1.2 0005	2.1.2 Sampling Data	Memorandum/Additional split sample of treated effluent analysis with attached sampling data	12/28/82	4	Stanley Sturges/DEQ	Charles Knoll/TWCA	
AR 2.1.2 0006	2.1.2 Sampling Data	Memorandum/Results of acute toxicity test conducted on process waste water with attached sampling data	3/30/83	4	Joseph Cummins/EPA, Region X	Gerald Bell/DEQ	
AR 2.1.2 0007	2.1.2 Sampling Data	Letter/Sampling request for nonferrous metals with attached sampling data	6/3/85	16	Charles Knoll/TWCA	Jeanne Holmes/Radian Corporation	
AR 2.1.2 0008	2.1.2 Sampling Data	Transmittal letter/EPA sampling reports for Samples 88158-88169	6/21/85	19	Charles Knoll/TWCA	Kristyn Malina/Radian Analytical Services	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.2 0009	2.1.2 Sampling Data	Letter/Analysis of wastewater samples collected by TWCA per EPA 3/19/85 request with attached sampling data	9/16/85	32	Janet Goodwin/EPA, Washington D.C.	Chuck Knoll/TWCA	
AR 2.1.2 0010	2.1.2 Sampling Data	Transmittal letter/Analysis of EPA samples 88158-88169	9/24/85	22	John Vidumsky/Radian Corporation	Charles Knoll/TWCA	
AR 2.1.2 0011	2.1.2 Sampling Data	Transmittal memorandum/Data report regarding results of effluent toxicity evaluation	1/29/88	14	Joseph Cummins/EPA	Daniel Tangarone/EPA, Region X	
AR 2.1.2 0012	2.1.2 Sampling Data	Metals traffic reports for EPA samples	Unknown	15	EGD Sample Control Center-EPA	EPA	
	2.1.3 Nonferrous Metals Industry Study and Final Trip Report						
AR 2.1.3 0001	2.1.3 Nonferrous Metals Industry Study and Final Trip Report	Transmittal letter/Ammonia recovery plant data	7/20/79	4	Charles Knoll/TWCA	Roger Jungclaus/Sverdrup & Parcel and Associates, Inc.	
AR 2.1.3 0002	2.1.3 Nonferrous Metals Industry Study and Final Trip Report	Transmittal letter/EPA Final Trip Report with attached sampling data	6/19/80	13	Roger Jungclaus/Sverdrup & Parcel and Associates, Inc.	Thomas Nelson, Manager/TWCA	
AR 2.1.3 0003	2.1.3 Nonferrous Metals Industry Study and Final Trip Report	Letter/Review of Final Trip Report and sampling analytical results	8/20/80	3	Charles Knoll/TWCA	Roger Jungclaus/Sverdrup & Parcel and Associates, Inc.	
	2.1.4 Industrial Wastewater Sources of Total Organic Carbon						
AR 2.1.4 0001	2.1.4 Industrial Wastewater Sources of Total Organic Carbon	Transmittal letter/Study to evaluate unidentified total organic carbon sources with attached sampling data	2/10/81	20	Charles Knoll/TWCA	Ted Groszkiewicz/DEQ	
	2.1.5 Permits						

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.5 0001	2.1.5 Permits	Transmittal letter/Waste discharge permit	3/26/75	6	Kessler Cannon and Verner Adkison/DEQ	TWCA	
AR 2.1.5 0002	2.1.5 Permits	Figures/High resolution spectrum in the nitrogen ls energy region	1/13/77	2	Unknown	Unknown	
AR 2.1.5 0003	2.1.5 Permits	Transmittal letter/Addendum to waste permit 2012-J	3/11/77	3	William Young/DEQ	TWCA	
AR 2.1.5 0004	2.1.5 Permits	Transmittal letter/Addendum to waste permit 2012-J	4/3/78	1	William Young/DEQ	V.P. de Poix/TWCA	
AR 2.1.5 0005	2.1.5 Permits	Transmittal memorandum/Memorandum regarding approval of attached proposed waste permit	10/24/78	12	Al Goodman/Oregon Operations Office-EPA	Chuck Findley/EPA, Region X	
AR 2.1.5 0006	2.1.5 Permits	Letter/Review and approval by DEQ and EPA of waste permit with attached permit	10/31/78	8	William Young/DEQ	V.P. de Poix/TWCA	
AR 2.1.5 0007	2.1.5 Permits	Transmittal letter/Completed EPA application forms 1 and 2c for new consolidated permit and for renewal of waste discharge permit 2849-J	1/30/81	23	Thomas Nelson/TWCA	Charles Ashbaker/DEQ	
AR 2.1.5 0008	2.1.5 Permits	Transmittal letter/Additional information to be included with consolidated permit application form 2c	4/9/81	24	Charles Knoll/TWCA	Larry Patterson/DEQ	
AR 2.1.5 0009	2.1.5 Permits	Letter/Acknowledgement of consolidated application forms 1 and 2C and promulgation of effluent guidelines with attached waste discharge permit 2849-J	5/29/81	14	William Young/DEQ	TWCA	
	2.1.6 Violations/Penalty Assessments						
AR 2.1.6 0001	2.1.6 Violations/ Penalty Assessments	Stipulation and Final Order/Civil penalties and compliance with	7/1/77	8	William Young/DEQ	V.P. de Poix/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
		effluent limitations					
AR 2.1.6 0002	2.1.6 Violations/ Penalty Assessments	Letter/Review of discharge monitoring reports and notation of violations with attached Notice of Assessment of Civil Penalty No. WQ-WVR-79-118	12/27/79	5	William Young/DEQ	V.P. de Poix/TWCA	
AR 2.1.6 0003	2.1.6 Violations/ Penalty Assessments	Letter/Review of discharge monitoring report for 3/80 and notation of violations with attached Notice of Assessment of Civil Penalty No. WQ-WVR-80-96	6/23/80	6	William Young/DEQ	V.P. de Poix/TWCA	
	2.1.7 Compliance Inspection Reports						
AR 2.1.7 0001	2.1.7 Compliance Inspection Reports	Memorandum/Audit of DEQ compliance monitoring inspection with attached compliance inspection report	6/7/78	8	Alan Goodman/Oregon Operations Office-EPA	Harold Geren/EPA	
AR 2.1.7 0002	2.1.7 Compliance Inspection Reports	Compliance inspection report	5/21/78	4	Unknown/DEQ	EPA, Region X	
AR 2.1.7 0003	2.1.7 Compliance Inspection Reports	Compliance inspection report with attached letter from DEQ to TWCA	9/15/81	5	Ted Groszkiewicz/DEQ	EPA, Region X	
AR 2.1.7 0004	2.1.7 Compliance Inspection Reports	Memorandum/Audit of state compliance inspection with attached compliance inspection report	6/14/82	3	Bill Sobolewski/EPA	John Underwood/EPA	
AR 2.1.7 0005	2.1.7 Compliance Inspection Reports	Transmittal letter/Compliance inspection report	8/13/82	6	Stanley Sturges/DEQ	Charles Knoll/TWCA	
AR 2.1.7 0006	2.1.7 Compliance Inspection Reports	Transmittal letter/Compliance inspection report	6/8/83	10	Stanley Sturges/DEQ	Charles Knoll/TWCA	
AR 2.1.7 0007	2.1.7 Compliance Inspection Reports	Compliance inspection report	2/22/84	6	Stanley Sturges/DEQ	EPA, Region X	
AR 2.1.7 0008	2.1.7 Compliance Inspection Reports	Compliance inspection report	5/21/86	19	F.A. Skirvin/DEQ	EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.7 0009	2.1.7 Compliance Inspection Reports	Compliance inspection report	5/5/87	8	David St. Louis/DEQ	EPA, Region X	
AR 2.1.7 0010	2.1.7 Compliance Inspection Reports	Memorandum/Audits of compliance inspections	7/29/87	1	Daniel Tangarone/EPA	Rick Parkin/EPA	
	2.1.8 Best Available Treatment/Best Convention Technology (BAT/BCT)						
AR 2.1.8 0001	2.1.8 BAT/BCT	Letter/BAT/BCT applicable to effluent limitations with attached EPA memorandum regarding BAT/BCT development	1/4/79	2	William Young/DEQ	Donald Dubois/EPA	
AR 2.1.8 0002	2.1.8 BAT/BCT	Memorandum/BAT/BCT guidelines development for nonferrous metals industry	3/2/79	2	Edmund Struzeski/NEIC-EPA	Enforcement Director/ EPA, Region X	
AR 2.1.8 0003	2.1.8 BAT/BCT	Memorandum/Request for BAT guidelines on zirconium-hafnium	3/16/79	2	Robert Schaffer/EPA	Lloyd Reed/EPA	
AR 2.1.8 0004	2.1.8 BAT/BCT	Letter/Contract for development of effluent guidelines	4/26/79	1	Lloyd Reed/EPA	William Young/DEQ	
AR 2.1.8 0005	2.1.8 BAT/BCT	Record of communication/Phone call from Roger Jungclaus from Sverdrup & Parcel and Associates, Inc. regarding sampling at TWCA	5/14/79	1	J. Struzeski/NEIC-EPA	Files/EPA	
AR 2.1.8 0006	2.1.8 BAT/BCT	Memorandum/Comments on Sverdrup & Parcel and Associates, Inc. proposed wastewater sampling plan	6/20/79	2	Alan Goodman/Oregon Operations Office-EPA	Pat Williams/EPA	
AR 2.1.8 0007	2.1.8 BAT/BCT	Memorandum/BAT effluent limitation guidelines for zirconium with attached letter from DEQ to EPA regarding Phase I and II BAT guidelines	6/25/81	2	Harold Geren/EPA	Pat Williams/EPA	
	2.1.9 Discharge Monitoring Reports						

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.9 0001	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 1/80	2/14/80	1	Charles Knoll/TWCA	Ken Ashbaker/DEQ	
AR 2.1.9 0002	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 2/80	3/14/80	7	C.R. Knoll/TWCA	C. Kent Ashbaker/DEQ	
AR 2.1.9 0003	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 4/80	5/15/80	8	Charles Knoll/TWCA	C. Kent Ashbaker/DEQ	
AR 2.1.9 0004	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 3/85	4/15/85	2	Charles Knoll/TWCA	David St. Louis/DEQ	
AR 2.1.9 0005	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 4/85	5/15/85	1	Charles Knoll/TWCA	David St. Louis/DEQ	
AR 2.1.9 0006	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 6/85	6/14/85	1	Charles Knoll/TWCA	David St. Louis/DEQ	
AR 2.1.9 0007	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 8/85	9/13/85	1	Charles Knoll/TWCA	Fritz Skirvin/DEQ	
AR 2.1.9 0008	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 9/85	10/11/85	1	Charles Knoll/TWCA	Fritz Skirvin/DEQ	
AR 2.1.9 0009	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 2/86	3/12/86	1	Charles Knoll/TWCA	Fritz Skirvin/DEQ	
AR 2.1.9 0010	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 6/86	7/10/86	1	Charles Knoll/TWCA	Fritz Skirvin/DEQ	
AR 2.1.9 0011	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 8/86	9/15/86	1	Charles Knoll/TWCA	Fritz Skirvin/DEQ	
AR 2.1.9 0012	2.1.9 Discharge Monitoring Reports	Letter/Error in 10/86 report in hydrogen cyanide values recorded for 9/86 with attached sampling data	11/17/86	2	Charles Knoll/TWCA	F.A. Skirvin/DEQ	
AR 2.1.9 0013	2.1.9 Discharge Monitoring Reports	Discharge monitoring report for 1/88	1/88	11	Thomas Nelson/TWCA	DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.9 0014	2.1.9 Discharge Monitoring Reports	Letter/Error in 9/87 report in hydrogen cyanide values with attached sampling data	2/22/88	2	Kay Marcum/TWCA	F.A. Skirvin/DEQ	
AR 2.1.9 0015	2.1.9 Discharge Monitoring Reports	Transmittal letter/Discharge monitoring report for 2/88	3/14/88	12	Charles Knoll/TWCA	F.A. Skirvin/DEQ	
AR 2.1.9 0016	2.1.9 Discharge Monitoring Reports	Discharge monitoring report for 3/88	3/88	13	Thomas Nelson/TWCA	DEQ	
AR 2.1.9 0017	2.1.9 Discharge Monitoring Reports	Discharge monitoring report for 4/88	4/88	10	Thomas Nelson/TWCA	DEQ	
	2.1.10 Alternate Test Procedure for Cyanide						
AR 2.1.10 0001	2.1.10 Alternate Test Procedure for Cyanide	Application requesting approval of alternate test procedure for determination of total cyanide in wastewaters	11/19/86	141	Thomas Nelson/TWCA	Fred Hansen/DEQ	
AR 2.1.10 0002	2.1.10 Alternate Test Procedure for Cyanide	Letter/Review of application for approval of alternate test procedure	3/26/87	1	Robert Courson/EPA	Fred Hansen/DEQ	
	2.2 Resource Conservation and Recovery Act (RCRA)/State Dangerous Waste						
	2.2.1 Correspondence						
AR 2.2.1 0001	2.2.1 Correspondence	Letter/Review and revision of hazardous waste permit application	12/4/81	2	Linda Dawson/EPA, Region X	Charles Knoll/TWCA	
AR 2.2.1 0002	2.2.1 Correspondence	Letter/Amended waste permit application	1/15/82	2	Charles Knoll/TWCA	Linda Dawson/TWCA	
AR 2.2.1 0003	2.2.1 Correspondence	Letter/Completion of processing information submitted in Part A permit application	3/16/82	3	Kenneth Feigner/EPA, Region X	Thomas Nelson/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.1 0004	2.2.1 Correspondence	Letter/Byproducts and waste residues which are ignitable hazardous materials with attached report entitled "Description of Ignitable Hazardous Wastes and Waste Management Procedures at Teledyne Wah Chang Albany"	4/5/82	32	Charles Knoll/TWCA	Richard Reiter/DEQ	
AR 2.2.1 0005	2.2.1 Correspondence	Memorandum/Compliance inspection and Part A permit application with attached letter from DEQ to TWCA regarding hazardous waste inspection	5/82	2	Unknown	Unknown	
AR 2.2.1 0006	2.2.1 Correspondence	Transmittal memorandum/Telephone use report regarding conversation with Stan Sturges of DEQ on groundwater monitoring at sludge ponds and a fire on magnesium chloride pile	7/29/83	2	Al Goodman/Oregon Operations Office-EPA	EPA Files	
AR 2.2.1 0007	2.2.1 Correspondence	Letter/Formal request for Part B application	8/2/83	2	Alexandra Smith/EPA, Region X	Thomas Nelson/TWCA	
AR 2.2.1 0008	2.2.1 Correspondence	Letter/Current hazardous waste management practices that do not meet permit standards	10/12/83	1	George Hofer/EPA, Region X	Thomas Nelson/TWCA	
AR 2.2.1 0009	2.2.1 Correspondence	Record of communication/Phone call with Mike Flynn regarding barium limits for soil in waste pile closure	10/21/83	1	Paul Day/EPA	Files/EPA	
AR 2.2.1 0010	2.2.1 Correspondence	Record of communication/Phone call with Burnell Vincent regarding significant contamination in groundwater monitoring wells	10/21/83	1	Paul Day/EPA	Files/EPA	
AR 2.2.1 0011	2.2.1 Correspondence	Record of communication/Phone call with Al Geswein regarding waste pile on old non-regulated sludge pond and floodplain standard	10/21/83	1	Paul Day/EPA	Files/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.1 0012	2.2.1 Correspondence	Letter/Review of draft Part B application	1/30/84	2	Paul Day/EPA	Charles Knoll/EPA	
AR 2.2.1 0013	2.2.1 Correspondence	Letter/Submittal of Part B application to DEQ	2/29/84	2	Stanley Sturges/DEQ	Charles Knoll/TWCA	
AR 2.2.1 0014	2.2.1 Correspondence	Letter/EPA visit and review of report regarding the treatment of industrial process wastewater discharges	3/26/84	1	Charles Knoll/TWCA	Paul Day/EPA	
AR 2.2.1 0015	2.2.1 Correspondence	Letter/Review of TWCA response to a Notice of Deficiency and Warning letter dated 4/6/84	6/8/84	2	Charles Findley/EPA	Thomas Nelson/TWCA	
AR 2.2.1 0016	2.2.1 Correspondence	Letter/Review and request for resubmittal of Part A application with corrections	6/25/84	2	William Hartford/DEQ	Thomas Nelson/TWCA	
AR 2.2.1 0017	2.2.1 Correspondence	Letter/Formal request to consider certain operations exempt from current EPA hazardous waste regulations	7/17/84	4	Thomas Nelson/TWCA	George Hofer/EPA	
AR 2.2.1 0018	2.2.1 Correspondence	Letter/Acknowledgement of receipt of request to consider certain operations exempt	7/26/84	1	Charles Findley/EPA	Thomas Nelson/TWCA	
AR 2.2.1 0019	2.2.1 Correspondence	Letter/Request for an exemption for the thermal treatment smokehouse facility, water reaction vessels, and magnesium chloride pile from hazardous waste regulations with attached letter from TWCA to DEQ regarding request and Part A application	8/8/84	11	Richard Reiter/DEQ	Thomas Nelson/TWCA	
AR 2.2.1 0020	2.2.1 Correspondence	Memorandum/Initiation of comprehensive and legal review of	8/27/84	1	John Skinner/EPA	Charles Findley/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
		RCRA applicability to certain TWCA operations					
AR 2.2.1 0021	2.2.1 Correspondence	Letter/Notification of 1984 amendments to RCRA	1/17/85	4	Charles Findley/EPA	Charles Knoll/TWCA	
AR 2.2.1 0022	2.2.1 Correspondence	Record of communication/Phone call from Chuck Knoll regarding mining exclusion	1/31/85	1	Paul Day/EPA	Files/EPA	
AR 2.2.1 0023	2.2.1 Correspondence	Memorandum/Applicability of Subtitle C to TWCA	2/4/85	3	John Skinner/EPA	Charles Findley/EPA	
AR 2.2.1 0024	2.2.1 Correspondence	Letter/EPA headquarters findings on RCRA applicabilty to TWCA	2/15/85	2	Charles Findley/EPA	Charles Knoll/TWCA	
AR 2.2.1 0025	2.2.1 Correspondence	Letter/Ignitability of solid material	2/27/85	1	Charles Knoll/TWCA	Charles Findley/EPA	
AR 2.2.1 0026	2.2.1 Correspondence	Memorandum/TWCA management plan	6/21/85	3	Unknown/EPA	Unknown/EPA	
AR 2.2.1 0027	2.2.1 Correspondence	Letter/Results of ignitability testing of solid material samples from TWCA with attached letter from Research Triangle Institute to EPA regarding samples	8/21/85	4	Charles Findley/EPA	Charles Knoll/TWCA	
AR 2.2.1 0028	2.2.1 Correspondence	Letter/Results of ignitability testing of solid material samples	9/12/85	1	Charles Knoll/TWCA	Charles Findley/EPA	
AR 2.2.1 0029	2.2.1 Correspondence	Letter/Review of proposed rule on mining waste exclusion	11/8/85	1	Charles Knoll/TWCA	Dexter Hinckley/EPA, Washington D.C.	
AR 2.2.1 0030	2.2.1 Correspondence	Letter/Comments on proposed mining waste exclusion rule	11/26/85	3	Charles Knoll/TWCA	Docket Clerk/EPA, Washington D.C.	
AR 2.2.1 0031	2.2.1 Correspondence	Memorandum/Report of acid spill at TWCA	2/23/87	1	C. Parker/DEQ	Hazardous Waste Division-DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity						
AR 2.2.2 0001	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Notification of hazardous waste activity with attached letter Charles Knoll to EPA regarding modification of Notice of Hazardous Waste Activity	11/18/80	8	Thomas Nelson/TWCA	EPA	
AR 2.2.2 0002	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Record of communication/Phone call from Charles Knoll regarding revision of Part A application	2/18/82	1	Linda Dawson/EPA	Files/EPA	
AR 2.2.2 0003	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Record of communication/Phone call with Charles Knoll regarding incinerators listed in Part A application	3/5/82	1	Linda Dawson/EPA	Files/EPA	
AR 2.2.2 0004	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Letter/Revisions in waste permit application	3/9/82	1	Charles Knoll and Thomas Nelson/TWCA	Linda Dawson/EPA	
AR 2.2.2 0005	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Memorandum/Conditions of operation during interim status	3/16/82	1	Unknown/EPA	EPA	
AR 2.2.2 0006	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Transmittal letter/Modified Notice of Hazardous Waste Activity	5/23/82	13	Charles Knoll/TWCA	Betty Weise/EPA, Region X	
AR 2.2.2 0007	2.2.2 Permit Applications/Notifications of Hazardous Waste Activity	Transmittal letter/Modified Notice of Hazardous Waste Activity	5/23/82	26	Charles Knoll/TWCA	Linda Dawson/EPA	
	2.2.3 Compliance Inspection Reports						

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.3 0001	2.2.3 Compliance Inspection Reports	Compliance inspection report	10/1/81	22	Donald Donaldson/EPA, Region X	Glenn Rodenhurst/EPA	
AR 2.2.3 0002	2.2.3 Compliance Inspection Reports	Transmittal letter/EPA field trip report	10/12/83	6	George Hofer/EPA	Thomas Nelson/TWCA	
AR 2.2.3 0003	2.2.3 Compliance Inspection Reports	Compliance inspection report	2/86	28	Laura Hamilton/DEQ	EPA, Region X	
	2.2.4 Treatment of Industrial Process Wastewater Discharges						
AR 2.2.4 0001	2.2.4 Treatment of Industrial Process Wastewater Discharges	Report entitled "Treatment of Industrial Process Wastewater Discharges at Teledyne Wah Chang Albany, Located in Albany, Oregon"	2/15/84	65	Charles Knoll/TWCA	Paul Day/EPA	
	2.2.5 Violations/Penalty Assessments						
AR 2.2.5 0001	2.2.5 Violations/ Penalty Assessments	Letter/Ignition of 21,000 cubic foot hazardous waste pile with attached Notice of Assessment of Civil Penalty No. AQOB-WVR-83-73 and news article from the Oregonian	8/17/83	8	William Young/DEQ	CT Corporation Systems as registered agent for TWCA	
AR 2.2.5 0002	2.2.5 Violations/ Penalty Assessments	Violation assessment with attached field trip report and facility inspection form	10/20/83	24	C.W. Rice/EPA	Files/EPA	
	2.2.6 Sampling Data						
AR 2.2.6 0001	2.2.6 Sampling Data	Possible sources of hazardous waste inventory	8/15/79	2	Ted Groszkiewicz/DEQ	EPA, Region X	
AR 2.2.6 0002	2.2.6 Sampling Data	Field sample data sheet with attached sampling analysis data	5/23/84	8	Stan Sturges/DEQ	EPA, Region X	
AR 2.2.6 0003	2.2.6 Sampling Data	Laboratory analysis report for sludge, solid waste, and effluent samples	7/20/84	8	Region X Laboratory-EPA	EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.6 0004	2.2.6 Sampling Data	Laboratory analysis report for sludge, solid waste, and effluent samples	7/20/84	7	Region X Laboratory-EPA	EPA, Region X	
AR 2.2.6 0005	2.2.6 Sampling Data	Laboratory analysis report for sludge, solid waste, and effluent samples	7/24/84	25	Region X Laboratory-EPA	EPA, Region X	
	2.2.7 Quality Assurance/Quality Control (QA/QC) Sampling Protocol						
AR 2.2.7 0001	2.2.7 QA/QC Sampling Protocol	Memorandum/Description of sample methods used to collect samples identified on DEQ request for analysis with attached request for analysis and diagrams	6/5/84	8	Stan Sturges/DEQ	Files/DEQ	
AR 2.2.7 0002	2.2.7 QA/QC Sampling Protocol	Report entitled "Laboratory Evaluation of Test Procedures for Use in the RCRA Hazardous Waste Ignitability Characteristic"	Unknown	42	L.C Michael, R.L. Perritt, and E.D. Pellizzari/Research Triangle Institute and F. Richardson/EPA, Washington D.C.	EPA	
	2.2.8 Review of Waste Exclusion Petition						
AR 2.2.8 0001	2.2.8 Review of Waste Exclusion Petition	Letter/Review of waste exclusion petition with Attachment 1 regarding zirconium, hafnium, and titanium production, Attachment 2 regarding wastes treated in the smokehouse, Attachment 3 regarding wastes treated in crucible burn pots, and Attachment 4 regarding ignitability of selected metal wastes	10/26/84	41	Stuart Haus/Mitre	Angela Wilkes/EPA, Washington D.C.	
	2.2.9 Requests for Information and Responses						

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.9 0001	2.2.9 Requests for Information and Responses	Letter/Request for information pursuant to Section 3007 of RCRA regarding hazardous waste land disposal units that had interim status before 11/8/85, and/or stored hazardous waste after 11/19/80	11/20/85	3	Charles Findley/EPA	Charles Knoll/TWCA	
AR 2.2.9 0002	2.2.9 Requests for Information and Responses	Letter/Response to request for information dated 11/20/85 with attached letter dated 11/20/85 from EPA to TWCA and letter dated 7/26/85 from Research Triangle Institute to EPA	12/13/85	6	Charles Knoll/TWCA	Kenneth Feigner/EPA	
	2.2.10 Magnesium Chloride Treatment Process						
AR 2.2.10 0001	2.2.10 Magnesium Chloride Treatment Process	Letter/Rocks recovered from magnesium pile and treated with sodium sulfate with attached letter from DEQ to TWCA dated 8/21/85, letter from TWCA to DEQ dated 8/2/85, and sampling data	8/23/85	5	Laura Hamilton/DEQ	Paul Day/EPA	
AR 2.2.10 0002	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Inspection report of rock treatment process and conclusion of regulatory status of rocks	9/18/85	4	Laura Hamilton/DEQ	Chuck Knoll/TWCA	
AR 2.2.10 0003	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information package on process for recovery of recyclable materials from the magnesium resource recovery pile	10/3/83	23	Thomas Nelson/TWCA	John Borden/Oregon Department of Environmental Quality (DEQ)	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0004	2.2.10 Magnesium Chloride Treatment Process	Review and conditional approval of information package on process for recovery of recyclable materials from the magnesium resource recovery pile	10/19/83	3	Stanley Sturges/DEQ	Thomas Nelson/TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0005	2.2.10 Magnesium Chloride Treatment Process	Letter/Response to review and conditional approval of information package on process for recovery of recyclable materials	10/26/83	5	Thomas Nelson/TWCA	John Borden/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0006	2.2.10 Magnesium Chloride Treatment Process	Letter/Modification to information package on process for recovery of recyclable materials	11/3/83	1	Stanley Sturges/DEQ	Thomas Nelson/TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0007	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information and engineering specifications on the installation and operation of the first phase of the process to recover recyclable materials from the magnesium resource recovery pile	1/5/84	56	Charles Knoll/TWCA	Stanley Sturges/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0008	2.2.10 Magnesium Chloride Treatment Process	Memorandum/Notice of Intent to Construct and Request for Construction Approval	2/7/84	3	David St. Louis/DEQ	Charles Knoll/TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0009	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Photographs taken on 3/20/84 in the smokehouse thermal treatment facility	5/22/84	3	Charles Knoll/TWCA	Paul Day/EPA, Region X	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0010	2.2.10 Magnesium Chloride Treatment Process	Letter/Final process procedure details and associated trial data for recovery process for recyclable materials from the magnesium resource recovery pile	7/9/84	1	Stanley Sturges/DEQ	Charles Knoll/TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0011	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information and specifications on installation and operation of the process for recyclable materials from the magnesium resource recovery pile	7/27/84	7	John Bohmker/TWCA	Stanley Sturges/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0012	2.2.10 Magnesium Chloride Treatment Process	Memorandum/Notice of Intent to Construct and Request for Construction Approval	10/24/84	3	Stanley Sturges/DEQ	Chuck Knoll/TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0013	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 10/84 and 11/84	1/17/85	11	Charles Knoll/TWCA	Stanley Sturges/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0014	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 12/84, 1/85, and 2/85	4/4/85	16	Charles Knoll/TWCA	David St. Louis/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0015	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 3/85 and 4/85	6/25/85	11	Charles Knoll/TWCA	David St. Louis/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0016	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 5/85, 6/85, and 7/85	11/13/85	16	Charles Knoll/TWCA	F.A. Skirvin/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0017	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly report on process for 1/86	1/86	19	TWCA	DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
AR 2.2.10 0018	2.2.10 Magnesium Chloride Treatment Process	Report entitled "Field Trial for Land Application of Magnesium Resource Recovery Process Residue"	2/86	27	CH2M HILL	TWCA	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0019	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports for process for 3-8/86	1/30/87	49	Charles Knoll/TWCA	F.A. Skirvin/DEQ	Confidential portion of record at EPA Region X Headquarters, Seattle, Washington
2.3 Clean Air Act (CAA)							
2.3.1 Correspondence							
AR 2.3.1 0001	2.3.1 Correspondence	Notes/Study of possible fugitive pollutants that may contribute to ambient pollutant levels that exceed regulations	1/14/76	1	Mark Hooper/EPA	EPA	
AR 2.3.1 0002	2.3.1 Correspondence	Memorandum/Inspection of TWCA facilities from various location s outside the plant fence	4/6/76	1	Larry Sims/EPA	Mark Hooper/EPA	
AR 2.3.1 0003	2.3.1 Correspondence	Memorandum/"Mercaptan like" odor with attached Pollution Complaints	8/14/85	5	Dave/DEQ	Fritz/DEQ	
AR 2.3.1 0004	2.3.1 Correspondence	Letter/Air pollutant emissions	3/12/87	1	Ole Anderson	DEQ	
AR 2.3.1 0005	2.3.1 Correspondence	Postcard/Request for correct chemical name for an organic solvent	3/20/87	1	Jean Hale	DEQ	
AR 2.3.1 0006	2.3.1 Correspondence	Letter/New permit for air pollutant emissions	3/23/87	2	Bryan Ford	DEQ	
AR 2.3.1 0007	2.3.1 Correspondence	Letter/New permit for air pollutant emissions	3/87	1	Thomas Hall	Lloyd Kostow/DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.3.1 0008	2.3.1 Correspondence	Letter/Response to comments on new permit for air pollutant emissions	4/27/87	2	Lloyd Kostow/DEQ	Bryan Ford	
	2.3.2 Order Confirming Compliance Agreement						
AR 2.3.2 0001	2.3.2 Order Confirming Compliance Agreement	Order confirming compliance agreement	2/25/72	5	Harry Carson/Mid-Willamette Valley Air Pollution Authority	TWCA	
	2.3.3 Compliance Inspection Reports						
AR 2.3.3 0001	2.3.3 Compliance Inspection Reports	Memorandum/Compliance inspection conducted on 9/23/75	9/23/75	3	Norm Edmisten/EPA, Region X	Files/EPA, Region X	
AR 2.3.3 0002	2.3.3 Compliance Inspection Reports	Review of compliance status of TWCA	1/6/77	11	DEQ	EPA, Region X	
AR 2.3.3 0003	2.3.3 Compliance Inspection Reports	Notes/Compliance inspections	7/3/79	1	Unknown	EPA, Region X	
AR 2.3.3 0004	2.3.3 Compliance Inspection Reports	Air pollution source inspection CDS update report	6/10/81	1	Berger/DEQ and Jim Herlihy/Oregon Operations Office-EPA	EPA, Region X	
AR 2.3.3 0005	2.3.3 Compliance Inspection Reports	Notes/TWCA plant processes	9/15/82	4	Unknown	Unknown	
AR 2.3.3 0006	2.3.3 Compliance Inspection Reports	Air pollution source inspection CDS update report	2/16/83	1	Jim Herlihy/Oregon Operations Office-EPA and Stan Sturges/DEQ	EPA, Region X	
AR 2.3.3 0007	2.3.3 Compliance Inspection Reports	Letter/Compliance with air contaminant discharge permit with attached Source Inspection Form and DEQ interoffice memorandum regarding air quality inspection	6/25/84	6	Stanley Sturges/DEQ	Ed Riggs/TWCA	
AR 2.3.3 0008	2.3.3 Compliance Inspection Reports	Compliance inspection report with attached handwritten notes and diagrams	6/26/84	7	Paul Boys/EPA, Region X	EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.3.3 0009	2.3.3 Compliance Inspection Reports	Memorandum/Compliance inspection	6/27/84	1	Paul Boys/EPA	Mike Johnston/EPA, Region X	
	2.3.4 Air Quality Compliance Study						
AR 2.3.4 0001	2.3.4 Air Quality Compliance Study	Proposed Scope of Work	7/30/76	3	Technology Division-GCA	EPA, Region X	
AR 2.3.4 0002	2.3.4 Air Quality Compliance Study	Transmittal memorandum/Scope of Work for air quality study and control strategy development	11/3/76	6	Norm Edmisten/Oregon Operations Office-EPA	Mark Hooper/EPA	
AR 2.3.4 0003	2.3.4 Air Quality Compliance Study	Transmittal memorandum/Proposed Scope of Work for aerometric study	12/23/76	6	Norm Edmisten/Oregon Operations Office-EPA	George Hofer, Clark Gaulding, and Mark Hooper/EPA	
AR 2.3.4 0004	2.3.4 Air Quality Compliance Study	Transmittal memorandum/Revised contract for air quality study	12/29/76	7	Myra Cypser/EPA, Washington D.C.	Norm Edmisten/Oregon Operations Office-EPA	
AR 2.3.4 0005	2.3.4 Air Quality Compliance Study	Memorandum/Air quality compliance study	1/2/77	2	Unknown	EPA, Region X	
AR 2.3.4 0006	2.3.4 Air Quality Compliance Study	Letter/Acceptance of attached Scope of Work	1/19/77	4	William Young/DEQ	Donald Dubois/EPA	
AR 2.3.4 0007	2.3.4 Air Quality Compliance Study	Report entitled "Millersburg Industrial Complex Air Quality and Compliance Study; Task 1: Data Analysis and Survey Design"	9/30/77	77	David Gunter, David Lynn, and Arthur Werner/GCA	EPA, Washington D.C.	
	2.3.5 Citizens for a Clean Environment Data Submittal						
AR 2.3.5 0001	2.3.5 Citizens for a Clean Environment Data Submittal	Memorandum/Attached information from Citizens for a Clean Environment regarding sulfur dioxide, sulfur trioxide, and hydrochloric acid emissions	4/1/77	43	Mark Hooper/EPA	George Hofer/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.3.5 0002	2.3.5 Citizens for a Clean Environment Data Submittal	Transmittal memorandum/Article entitled Predicting Dew Points of Flue Gases used by Citizens for a Clean Environment	4/4/77	3	Mark Hooper/EPA	George Hofer/EPA	
	2.3.6 Air Contaminant Discharge Permit						
AR 2.3.6 0001	2.3.6 Air Contaminant Discharge Permit	Transmittal letter/Air Contaminant Discharge Permit 22-0547	7/3/78	4	F.A. Skirvin/DEQ	Donald Dubois/EPA	
	2.3.7 Fugitive Emission Assessment and Control Strategy Development						
AR 2.3.7 0001	2.3.7 Fugitive Emission Assessment and Control Strategy Development	Report entitled "Millersburg: Fugitive Emission Assessment and Control Strategy Development"	3/31/79	65	Peter Spawn/GCA	EPA, Washington D.C.	
2.4	Oregon State Health Division Radioactive Materials License						
	2.4.1 Notice of Noncompliance						
AR 2.4.1 0001	2.4.1 Notice of Noncompliance	Letter/Failure of uranium extraction process in removal of uranium from waste effluent pumped to new dewatering lagoons with attached radioactive materials license, maps, sampling data, notes regarding chlorinator residue pile, and DEQ interoffice memorandum regarding insufficiency of monitoring efforts at sludge disposal site	10/30/80	12	Marshall Parrott/DEQ	R.T. VanSanten/TWCA	
2.5	Toxic Substances Control Act (TSCA)						
	2.5.1 Status Reports on Compliance with PCB Regulations						
AR 2.5.1 0001	2.5.1 Status Reports on Compliance with PCB Regulations	Equipment containing PCB	1/13/81	4	Unknown	Unknown	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.5.1 0002	2.5.1 Status Reports on Compliance with PCB Regulations	Equipment in building 23 and 75 containing PCB	1981	5	Unknown	Unknown	
AR 2.5.1 0003	2.5.1 Status Reports on Compliance with PCB Regulations	Equipment in buildings 23 and 75 containing PCB	1982	5	Unknown	Unknown	
AR 2.5.1 0004	2.5.1 Status Reports on Compliance with PCB Regulations	Corrective action to bring TWCA into compliance with PCB regulations with attached letter dated 6/29/83 from EPA to TWCA regarding PCB reports for 1982	12/16/82	4	Charles Knoll/TWCA	EPA, Region X	
	2.5.2 PCB Inspection Reports						
AR 2.5.2 0001	2.5.2 PCB Inspection Reports	PCB transformer maintenance reports	1/82-8/27/82	7	TWCA	EPA, Region X	
AR 2.5.2 0002	2.5.2 PCB Inspection Reports	PCB inspection narrative	8/31/82	6	Alan Goodman/Oregon Operations Office-EPA	EPA, Region X	
AR 2.5.2 0003	2.5.2 PCB Inspection Reports	Investigation summary	8/31/82	1	Alan Goodman/Oregon Operations Office-EPA	EPA, Region X	
	2.5.3 Violation Assessments						
AR 2.5.3 0001	2.5.3 Violation Assessments	Violation assessment	8/31/82	1	Alan Goodman/Oregon Operations Office-EPA	EPA, Region X	
	2.5.4 Notice Letters and Responses						
AR 2.5.4 0001	2.5.4 Notice Letters and Responses	Notice of inspection	8/31/82	1	Alan Goodman/Oregon Operations Office-EPA	EPA, Region X	
AR 2.5.4 0002	2.5.4 Notice Letters and Responses	Letter/Noncompliance with PCB regulations	11/18/82	3	Alexandra Smith/EPA, Region X	V.P. de Poix/TWCA	
AR 2.5.4 0003	2.5.4 Notice Letters and Responses	Response letter/Notice of noncompliance dated 11/18/82	12/17/82	1	Donald Donaldson/EPA	Thomas Nelson/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
2.6 Site Certification (Energy Facility Siting Council - Oregon Department of Energy)							
	2.6.1 Correspondence						
AR 2.6.1 0001	2.6.1 Correspondence	Letter/Closure of lower solids pond site	8/31/82	3	Chris Wheeler/Water Resources Department-Oregon State	Frank Ostrander/ Department of Justice (DOJ) and Don Godard/Department of Energy (DOE)	
AR 2.6.1 0002	2.6.1 Correspondence	Memorandum/Application to Oregon Energy Facility Siting Council (EFSC) for onsite disposal of low-level radioactive materials	9/29/82	3	Hussein Aldis/Ecology and Environment, Inc.	Bob Poss/EPA, Region X	
AR 2.6.1 0003	2.6.1 Correspondence	Memorandum/Applicability of RCRA to low-level radioactive materials with attached handwritten notes and sampling data	9/29/82	8	Al Goodman/Oregon Operations Office-EPA	Bob Poss/EPA	
	2.6.2 Application Hearing						
AR 2.6.2 0001	2.6.2 Application Hearing	Transmittal letter/Answers to questions posed by hearing officers at 8/16/82 hearing	8/27/82	13	David Stewart-Smith/Oregon Department of Human Resources (DHR)	Frank Ostrander/DOJ and Donald Godard/DOE	
AR 2.6.2 0002	2.6.2 Application Hearing	Transmittal letter/Completion of answers to questions posed by hearing officers at 8/16/82 hearing	8/31/82	6	David Stewart-Smith/DHR	Frank Ostrander/DOJ and Donald Godard/DOE	
AR 2.6.2 0003	2.6.2 Application Hearing	Transmittal letter/Answers to questions posed by hearing officers at 8/16/82 hearing	9/1/82	9	Stanley Sturges/DEQ	Frank Ostrander/DOJ and Donald Godard/DOE	
AR 2.6.2 0004	2.6.2 Application Hearing	Memorandum/Preparation for 10/82 hearing regarding waste sludge	9/29/82	2	M.H. Hooper/EPA	R.A. Poss/EPA	
AR 2.6.2 0005	2.6.2 Application Hearing	Memorandum/Radiological aspects of site certification	9/30/82	3	Edward Cowan/Unknown	Bob Poss/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.6.2 0006	2.6.2 Application Hearing	Letter/Compatibility of CERCLA and RCRA with proposed onsite disposal of low-level radioactive materials	10/19/82	2	John Spencer, Regional Administrator/EPA, Region X	Frank Ostrander/DOJ and Donald Godard/DOE	
AR 2.6.2 0007	2.6.2 Application Hearing	Site Certificate Application					Oregon Department of Energy Facility Siting Council
	2.6.3 Groundwater Management Study						
AR 2.6.3 0001	2.6.3 Groundwater Management Study	Memorandum/Technical review of TWCA groundwater management program	7/9/82	20	CH2M HILL	Charles Knoll/TWCA	
	2.6.4 Radon Studies (Battelle)						
AR 2.6.4 0001	2.6.4 Radon Studies	Study entitled "Radon Exhalation From Old-Lime Solid Waste"	6/9/82	32	H.D. Freeman and J.N. Hartley/Battelle Pacific Northwest Laboratories (Battelle)	TWCA	
AR 2.6.4 0002	2.6.4 Radon Studies	Study entitled "Analysis of Radon Release From TWCA Old-Lime Solid Waste and Oar Air Pathway Exemption"	8/85	4	J.N. Hartley, H.D. Freeman, and G.W. Gee/Battelle	TWCA	
AR 2.6.4 0003	2.6.4 Radon Studies	Supplement 1 to "Analysis of Radon Release From TWCA Old-Lime Solid Waste and Oar Air Pathway Exemption"	12/85	4	J.N. Hartley, H.D. Freeman, G.W. Gee, and M.R. Toland/Battelle	TWCA	
	2.6.5 Final Order/Site Certificate						
AR 2.6.5 0001	2.6.5 Final Order/Site Certificate	Final Order and Site Certificate with attached Appendices and Certificate of Service	12/15/82	73	Allen Nistad/EFSC	TWCA	

SECTION 3.0 REMEDIAL INVESTIGATION - ENTIRE SITE

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
3.1 Correspondence	3.1 Correspondence	Letter/Review of Remedial Action Master Plan (RAMP)	7/20/87	5	Kenneth Bird/Teledyne Wah Chang Albany (TWCA)	Neil Thompson/EPA, Region X	
AR 3.1 0001							
AR 3.1 0002	3.1 Correspondence	Letter/Request for copies of two reports referenced in RAMP	7/20/87	1	Kenneth Bird/TWCA	Neil Thompson/EPA	
AR 3.1 0003	3.1 Correspondence	Letter/Transmittal of work plan for remedial investigation/feasibility study (RI/FS) and acceleration of portion of RI/FS relating to Schmidt Lake and Lower River Solids Pond	7/30/87	1	Kenneth Bird/TWCA	Neil Thompson/EPA	
AR 3.1 0004	3.1 Correspondence	Letter/Utilization of TWCA analytical facilities during RI/FS	10/29/87	1	Kenneth Bird/TWCA	Neil Thompson/EFA	
AR 3.1 0005	3.1 Correspondence	Letter/Proposed schedule for submittal of revised work plan	12/01/87	1	Neil Thompson/EPA	Ken Bird/TWCA	
AR 3.1 0006	3.1 Correspondence	Letter/Installation of treatment system to reduce fluoride discharges per established effluent limitation guidelines with attached map	3/2/88	2	Kenneth Bird/TWCA	Neil Thompson/EPA	
AR 3.1 0007	3.1 Correspondence	Memorandum/Request for quality assurance/quality control (QA/QC) audit of TWCA facility	4/14/88	1	Neil Thompson/EPA	Barry Towns/EPA	
AR 3.1 0008	3.1 Correspondence	Memorandum/Approval process for work plan	8/9/88	4	Neil Thompson/EPA	Files/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 3.1 0009	3.1 Correspondence	Letter/Comments on "Preliminary Engineering Report on Permanent Lime Solids Containment for Teledyne Wah Chang Albany"	6/12/87	2	Neil Thompson/EPA	Tom Nelson/TWCA	
3.2 Background Reports							
AR 3.2 0001	3.2 Background Reports	Report entitled "Public Health Hazards Associated with the Storage of Certain Types of Low Level Radioactive Waste Materials in Oregon"	3/81	128	Science Applications, Inc. and H. Esmaili & Associates, Inc.	Oregon Department of Human Resources (DHR)	
AR 3.2 0002	3.2 Background Reports	Report entitled "Review of EPA and General Report Data on Teledyne Wah Chang Albany Zirconium Production Process and Its Waste Streams"	3/9/83	36	TWCA		
AR 3.2 0003	3.2 Background Reports	Scope of work and sampling and analysis plans and data for the nonferrous metals forming wastewater collection and transfer system	6/85-1/86	58	CH2M HILL	Oregon Department of Environmental Quality (DEQ)	
AR 3.2 0004	3.2 Background Reports	Report entitled "Characterization of the Content of the Lower River Solids Storage Pond and the Upper River Solids Storage Pond"	Unknown	205	Unknown		
AR 3.2 0005	3.2 Background Reports	Report entitled "Preliminary Engineering Report on Permanent Lime Solids Containment for Teledyne Wah Chang Albany"	5/1/87	51	Hazard Management Specialists	TWCA	
3.3 Remedial Action Master Plan (RAMP)							
AR 3.3 0001	3.3 RAMP	Letter/Submittal of information requested on well monitoring and request for copy of RAMP	3/31/83	1	Thomas Nelson, Manager/TWCA	Neil Thompson/EPA	
AR 3.3 0002	3.3 RAMP	Draft RAMP	7/83	174	NUS Corporation	EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
3.4 Work Plans, Quality Assurance Project Plans, Sampling and Analysis Plans (Planning Documents)							
	3.4.1 Work Plan Outline (EPA)						
AR 3.4.1 0001	3.4.1 Work Plan Outline	Final work plan outline	12/3/86	75	Woodward-Clyde Consultants	EPA, Region X	
	3.4.2 Draft Planning Documents						
AR 3.4.2 0001	3.4.2 Draft Planning Documents	Draft planning documents	8/87	502	CH2M HILL	TWCA	
	3.4.3 Comments on Draft Planning Documents						
AR 3.4.3 0001	3.4.3 Comments on Draft Planning Documents	Comments on work plan and sampling plan	8/17/87	4	Anita Wong Lovely/Tetra Tech, Inc.	Neil Thompson/EPA	
AR 3.4.3 0002	3.4.3 Comments on Draft Planning Documents	Comments on health and safety plan	8/25/87	2	Ron Blair/EPA, Region X	Neil Thompson/EPA	
AR 3.4.3 0003	3.4.3 Comments on Draft Planning Documents	Comments on work plan	9/3/87	1	Jon Schweiss/EPA, Region X	Neil Thompson/EPA	
AR 3.4.3 0004	3.4.3 Comments on Draft Planning Documents	Review of work plan	9/10/87	1	Neil Thompson/EPA	Kenneth Bird/TWCA	
AR 3.4.3 0005	3.4.3 Comments on Draft Planning Documents	Review of planning documents	9/16/87	2	Dana Davoli/EPA, Region X	Neil Thompson/EPA	
AR 3.4.3 0006	3.4.3 Comments on Draft Planning Documents	Review of planning documents	9/16/87	2	Jerry Leitch/EPA, Region X	Neil Thompson/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 3.4.3 0007	3.4.3 Comments on Draft Planning Documents	Review of EPA and DEQ comments on planning documents	9/16/87	1	Kenneth Bird/TWCA	Neil Thompson/EPA	
AR 3.4.3 0008	3.4.3 Comments on Draft Planning Documents	Comments on planning documents	9/16/87	25	Anita Wong Lovely/Tetra Tech, Inc.	Neil Thompson/EPA	
AR 3.4.3 0009	3.4.3 Comments on Draft Planning Documents	Review of planning documents	9/21/87	3	Glenn Bruck/EPA, Region X	Neil Thompson/EPA	
AR 3.4.3 0010	3.4.3 Comments on Draft Planning Documents	Letter/Lack of use of EPA guidance in development of planning documents	10/5/87	3	Neil Thompson/EPA	Kenneth Bird/TWCA	
AR 3.4.3 0011	3.4.3 Comments on Draft Planning Documents	Comments on planning documents	10/9/87	6	Roy Jones and Raleigh Farlow/EPA, Region X	Neil Thompson/EPA	
AR 3.4.3 0012	3.4.3 Comments on Draft Planning Documents	Compilation of comments from DEQ, Oregon Health Division, Department of Water Resources, Department of Energy (DOE), and Department of Justice (DOJ)	10/19/87	17	Tom Miller/DEQ	Neil Thompson/EPA	
AR 3.4.3 0013	3.4.3 Comments on Draft Planning Documents	Integrated Tetra Tech, Inc. and EPA comments on planning documents	10/27/87	36	Anita Wong Lovely/Tetra Tech, Inc.	Neil Thompson/EPA	
AR 3.4.3 0014	3.4.3 Comments of Draft Planning Documents	Transmittal letter/Compilation of comments received by EPA and DEQ project managers	10/30/87	2	Neil Thompson/EPA	Ken Bird/TWCA	
AR 3.4.3 0015	3.4.3 Comments of Draft Planning Documents	Letter/Receipt of comments received by EPA and DEQ project managers and revisions of draft work plan	11/15/87	1	Kenneth Bird/TWCA	Neil Thompson/EPA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 3.4.3 0016	3.4.3 Comments of Draft Planning Documents	Letter/Proposed submittal of the revise work plan	12/1/87	1	Neil Thompson/EPA	Ken Bird/TWCA	
	3.4.4 Revised Draft Planning Documents						
AR 3.4.4 0001	3.4.4 Revised Draft Planning Documents	Revised planning documents	1/88	584	CH2M HILL	TWCA	
AR 3.4.4 0002	3.4.4 Revised Draft Planning Documents	Revised planning documents	10/88	701	CH2M HILL	TWCA	
	3.4.5 Comments on Revised Draft Planning Documents						
AR 3.4.5 0001	3.4.5 Comments on Revised Draft Planning Documents	Comments on revised planning documents	3/15/88	30	Anita Wong Lovely/Tetra Tech, Inc.	Neil Thompson/EPA	
AR 3.4.5 0002	3.4.5 Comments on Revised Draft Planning Documents	Review of revised planning documents with attached sampling data and map	3/24/88	7	Unknown	Unknown	
AR 3.4.5 0003	3.4.5 Comments on Revised Draft Planning Documents	Integrated review comments on revised planning documents	4/14/88	69	Anita Wong Lovely/Tetra Tech, Inc.	Neil Thompson/EPA	

SECTION 4.0 FEASIBILITY STUDY - ENTIRE SITE

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location

SECTION 5.0 REMEDIAL INVESTIGATION - OPERABLE UNIT

Doc. #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
5.1 Correspondence							
AR [illegible]	5.1 Correspondence	Letter/Moving of lime solids material prior to EPA approval of disposal method	4/27/88	2	Fred Hansen/Oregon Department of Environmental Quality (DEQ)	James Denham/Teledyne Wah Chang Albany (TWCA)	
AR [illegible]	5.1 Correspondence	Letter/EPA approval of Chapter 4 of planning documents for remedial investigation/feasibility study (RI/FS)	7/26/88	10	Neil Thompson/EPA, Region X	Kenneth Bird/TWCA	
AR [illegible]	5.1 Correspondence	Memorandum/Monthly activity report regarding status of progress	8/11/88	2	Neil Thompson/EPA	Files/EPA, Region X	
AR [illegible]	5.1 Correspondence	Letter/Announcing TWCA's presentation of the RI/FS draft report 9:00 a.m., 6/09/89	6/02/89	1	Kenneth W. Bird/TWCA	Christine Gebbie/Oregon State Health Division	
5.2 Work Plan, Quality Assurance Project Plan (QAPP), and Sampling and Analysis Plan (SAP)							
AR [illegible]	5.2 Work Plan, QAPP, and SAP	QAPP for RI/FS	6/17/88	56	CH2M HILL	TWCA	
AR [illegible]	5.2 Work Plan, QAPP, and SAP	Revised draft work plan for operable unit	7/20/88	52	CH2M HILL	TWCA	
AR [illegible]	5.2 Work Plan, QAPP, and SAP	Draft SAP for operable unit	7/20/88	32	CH2M HILL	TWCA	
AR [illegible]	5.2 Work Plan, QAPP, and SAP	Letter/Conditional approval of work plan for the operable unit	7/26/88	9	Neil Thompson/EPA	Kenneth Bird/TWCA	
5.3 Investigation/Feasibility Study (RI/FS) Report							
AR [illegible]	5.3 RI/FS Report	RI/FS Report/Vol I of III Volumes	6/89	166	CH2M HILL	TWCA	
AR [illegible]	5.3 RI/FS Report	RI/FS Report/Vol II of III Volumes	6/89	247	CH2M HILL	TWCA	
AR [illegible]	5.3 RI/FS Report	RI/FS Report/Vol III of III Volumes	6/89	259	CH2M HILL	TWCA	

		Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
	Evaluations						
AR [illegible]	Comments and Evaluations	Comments on TWCA's Operable Unit RI/FS Report	7/01/89	6	Tetra Tech, Inc/ Jacobs Engineering Group, Inc	EPA	
AR [illegible]	Comments and Evaluations	Comments on TWCA's Operable Unit RI/FS Endangerment Assessment	7/13/89	12	Tetra Tech, Inc/ Jacobs Engineering Group, Inc	EPA	
AR [illegible]	Comments and Evaluations	Memorandum/Comments on draft Operable Unit RI/FS (Lime Solids), TWCA	7/17/89	2	Glenn Bruck/EPA	Neil Thompson/EPA	
AR [illegible]	Comments and Evaluations	Memorandum/Comments on TWCA's Operable Unit RI/FS study draft	7/26/89	2	Chip Humphrey/EPA	Neil Thompson/EPA	
AR [illegible]	Comments and Evaluations	Comments on TWCA's Operable Unit RI/FS	7/31/89	6	William H. Dana/ Oregon State DEQ		

SECTION 6.0 FEASIBILITY STUDY - OPERABLE UNIT

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location

SECTION 7.0 RECORD OF DECISION - ENTIRE SITE

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location

SECTION 8.0 RECORD OF DECISIONS - OPERABLE UNIT

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location

SECTION 9.0 STATE COORDINATION

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
9.1 Correspondence							
AR 9.1 0001	9.1 Correspondence	Transmittal memorandum/Draft Remedial Action Master Plan (RAMP)	8/11/84	1	Al Goodman/Oregon Operations Office-EPA	Rich Reiter/Oregon Department of Environmental Quality (DEQ)	
AR 9.1 0002	9.1 Correspondence	Letter/Notification of proposed Superfund project at Teledyne Wah Chang Albany (TWCA)	8/15/84	3	Kathryn Davidson/EPA, Region X	Dolores Streeter/ Intergovernmental Relations Division	
AR 9.1 0003	9.1 Correspondence	Oregon project notification and review system form/EPA proposed study	9/7/84	1	W. Parks/Division of State Lands	Intergovernmental Relations Division	
AR 9.1 0004	9.1 Correspondence	Oregon project notification and review system form/EPA proposed study	9/11/84	1	Dolores Streeter/ Intergovernmental Relations Division	EPA, Region X	
AR 9.1 0005	9.1 Correspondence	Letter/Sludge ponds relocation proposal	5/18/87	1	Kristine Gebbie/Oregon Department of Human Resources (DHR)	Neil Thompson/EPA, Region X	
AR 9.1 0006	9.1 Correspondence	Letter/Response to request to move lime solids from sludge ponds to a lined landfill and review of report entitled "Preliminary Engineering Report on Permanent Lime Solids Containment"	6/16/87	2	Ray Paris/DHR	Tom Nelson/TWCA	
AR 9.1 0006-1	9.1 Correspondence	Letter/Inclusion of proposal to move lime solids sludge ponds under EPA remedial investigation/feasibility study (RI/FS)	6/22/87	1	Thomas Nelson/TWCA	Ray Paris/DHR	
AR 9.1 0007	9.1 Correspondence	Letter/Inclusion of project to relocate lime solids in the EPA RI/FS	7/13/87	2	Ray Paris/DHR	Thomas Nelson/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 9.1 0008	9.1 Correspondence	Transmittal letter/Compilation of comments by DEQ, Oregon Health Division, Oregon Department of Water Resources, Oregon Department of Energy (DOE), Oregon Department of Justice (DOJ) on draft RI/FS planning documents	10/19/87	17	Tom Miller/DEQ	Neil Thompson/EPA	
AR 9.1 0009	9.1 Correspondence	Transmittal letter/Compilation of comments received by EPA and DEQ project managers for RI/FS planning documents	10/30/87	2	Neil Thompson/EPA	Ken Bird/TWCA	
AR 9.1 0010	9.1 Correspondence	Letter/Comments on RI/FS draft planning documents	3/14/88	3	Martha Dibblee/DHR	Tom Miller/DEQ	
AR 9.1 0011	9.1 Correspondence	Comments on RI/FS draft planning documents	4/4/88	19	Martha Dibblee/DHR, Tom Miller and Bruce Gilles/DEQ, and Dave Stewart-Smith/DOE	TWCA	
AR 9.1 0012	9.1 Correspondence	Letter/Adequacy of Oregon waste disposal laws and request for formation of citizens committee	9/1/83	1	Lloyd Marbet/Forelaws on Board	Governor Victor Atiyeh/State of Oregon	
AR 9.1 0013	9.1 Correspondence	Letter/Response to request for formation of citizens committee	9/83	1	Governor Victor Atiyeh/State of Oregon	Lloyd Marbet/Forelaws on Board	
AR 9.1 0014	9.1 Correspondence	Letter/Proposed changes for radionuclide analysis procedures	5/11/89	1	Bill Dana/Oregon State DEQ	George Toombs/Oregon State Health Division	
AR 9.1 0015	9.1 Correspondence	Letter/Request for Oregon State to identify all ARAR's for use in development of the ROD for TWCA (See AR 9.1 0017)	7/05/89	2	Carol Rushin/EPA	Tom Miller/Oregon State DEQ	
AR 9.1 0016	9.1 Correspondence	Letter/Consent Order between EPA and Oregon State DEQ to oversee the investigation and cleanup of TWCA	7/10/89	1	William H. Dana/Oregon State DEQ	Kristine Gebbie/Oregon State Health Division	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 9.1 0017	9.1 Correspondence	Letter/Response to letter by Carol Rushin (See AR 9.1 0015) concerning identifying state ARAR's for the TWCA Superfund site	7/25/89	1	Tom Miller/Oregon State DEQ	Carol Rushin/EPA	

SECTION 10.0 ENFORCEMENT

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
10.1 Correspondence							
AR 10.1 0001	10.1 Correspondence	Letter/Designation of Kenneth Bird as project manager and Thomas Nelson as substitute for remedial investigation/feasibility study (RI/FS)	6/17/87	1	James Denham/Teledyne Wah Chang Albany (TWCA)	Deborah Gates and Curt Burkholder/EPA, Region X	
AR 10.1 0002	10.1 Correspondence	Letter/Notice of lateness on delivery of RI/FS work plan with attached packing list	8/10/87	3	Tom Miller/Oregon Department of Environmental Quality (DEQ)	Neil Thompson/EPA, Region X	
AR 10.1 0003	10.1 Correspondence	Letter/Approval of request to relocate monitoring well for construction purposes	4/5/88	1	Neil Thompson/EPA	Ken Bird/TWCA	
AR 10.1 0004	10.1 Correspondence	Letter/Conditional approval of Chapter 4 to work plan entitled "Planning Documents, RI/FS Study, Teledyne Wah Chang Albany"	7/26/88	9	Neil Thompson/EPA	Kenneth Bird/TWCA	
AR 10.1 0005	10.1 Correspondence	Letter/Redetermination of documents no longer considered confidential by TWCA	11/3/88	1	Kenneth W. Bird, TWCA	Neil Thompson/EPA	
10.2 Notice Letters and Requests for Information							
AR 10.2 0001	10.2 Notice Letters and Requests for Information	Notice letter/Consideration of inclusion of TWCA on national priorities list (NPL) with attached letter from William Young of DEQ to John Spencer of EPA, Region X regarding listing	8/30/82	5	Alexandra Smith/EPA, Region X	Tom Nelson/TWCA	
AR 10.2 0002	10.2 Notice Letters and Requests for Information	Notice letter/Potential liability for contamination at TWCA and request for information with attached transmittal letter for information from TWCA to EPA	3/3/86	4	Charles Findley/EPA, Region X	Thomas Nelson/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 10.2 0003	10.2 Notice Letters and Requests for Information	Letter/Completion of consent order negotiations by 3/31/87 and commencement of formal RI/FS after 4/1/87 with attached notes from meeting regarding draft consent order	1/21/87	5	Deborah Gates/EPA	Robert Emmett/Reed, Smith, Shaw and McClay	
AR 10.2 0004	10.2 Notice Letters and Requests for Information	Letter/Designation of Kenneth Bird as project coordinator for RI/FS	5/8/87	1	James Denham/TWCA	Deborah Gates and D. Henry Elsen/EPA	
10.3 Administrative Orders							
AR 10.3 0001	10.3 Administrative Orders	Transmittal letter/Original Consent Order agreed upon in 4/87	5/1/87	1	Deborah Gates and D. Henry Elsen/EPA	James Denham/TWCA	
AR 10.3 0002	10.3 Administrative Orders	Order on Consent Docket No. 1086-02-19-106	5/5/87	33	John Wyse/TWCA and Charles Findley/EPA	EPA, Region X and TWCA	
AR 10.3 0003	10.3 Administrative Orders	Letter/Attached proposed amendment to 5/5/87 Consent Order	7/13/88	2	Monica Kirk/EPA, Region X	James Denham/TWCA	
AR 10.3 0004	10.3 Administrative Orders	Amendment to Order on Consent Docket No. 1086-02-19-106	8/19/88	1	A. Riesen/TWCA and Charles Findley/EPA	TWCA and EPA, Region X	

SECTION 11.0 HEALTH ASSESSMENTS

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
11.1 Health Assessments							
AR 11.1 0001	11.1 Health Assessment	Supplemental Health Risk Assessment. A supplement to the Endangerment Assessment prepared for the RI/FS for the first operable unit. Includes 7-page fact sheet dated 8/16/89	9/89	26	EPA		

SECTION 12.0 NATURAL RESOURCE TRUSTEES

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
12.1 Correspondence							
AR 12.1 0001	12.1 Correspondence	Letter/Review of information in application regarding request to increase production at Teledyne Wah Chang Albany (TWCA) plant with attached Summary Statement to be presented at 8/17/78 hearing on request	8/16/78	5	John Kincheloe/U.S. Department of Interior-Fish and Wildlife Service	Peter McSwain/Oregon Department of Environmental Quality (DEQ)	
AR 12.1 0002	12.1 Correspondence	Letter/Notification of application by TWCA for hazardous waste permit with attached letter from State Historic Preservation Office with comments on proposed application	3/19/84	6	Paul Day/EPA, Region X	Lee Gilson/Office of Archaeology and History Preservation, Jim Newton and Jim Bottorff/U.S. Fish and Wildlife Service, Richard Mathews, Department of Land Conservation and Development, and Ron Hyra/National Park Service	
AR 12.1 0003	12.1 Correspondence	Letter/Comments on hazardous waste permit	4/5/84	1	Frederick Bender/U.S. Department of Interior	Paul Day/EPA	
AR 12.1 0004	12.1 Correspondence	Letter/Hazardous waste permit and endangered species with attached map of Oregon	4/12/84	2	Russell Peterson/U.S. Department of Interior	Paul Day/EPA	
AR 12.1 0005	12.1 Correspondence	Letter/Information on listed and proposed endangered and threatened species which may be present within area of proposed hazardous waste storage permit	4/17/84	2	Jim Bottorff/U.S. Department of Interior	Paul Day/EPA	
AR 12.1 0006	12.1 Correspondence	Comments on sampling plan for remedial investigation/feasibility study (RI/FS)	9/23/87	9	Lew Consiglieri/National Oceanic and Atmospheric Administration (NOAA)	Neil Thompson/EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 12.1 0007	12.1 Correspondence	Letter/Review and comments on second draft of RI/FS work plan	3/17/88	5	Lew Consiglieri/NOAA	Neil Thompson/EPA	
	12.2 Reports						
AR 12.2 0001	12.2 Reports	Report/Chemical hazard to marine resources	6/30/85	4	Robert Pavia/NOAA	Neil Thompson/EPA	
	12.3 Memorandum of Understanding						
AR 12.3 0001	12.3 Memorandum of Understanding	Memorandum of Understanding among Bureau of Mines, U.S. Department of Interior, and EPA	6/1/87	11			

SECTION 13.0 CONGRESSIONAL HEARINGS/INQUIRIES

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
13.1 Correspondence							
AR 13.1 0001	13.1 Correspondence	Letter/Questions regarding regulation of Teledyne Wah Chang Albany (TWCA)	4/3/78	4	L.B. Day/Oregon State Senate	Donald Dubois, Regional Administrator/EPA, Region X	
AR 13.1 0002	13.1 Correspondence	Letter/Hazardous waste permit and effluent limitations with attached letter regarding review comments on permit	4/21/78	4	Donald Dubois, Regional Administrator/EPA, Region X	Robert Straub/Governor of Oregon	
AR 13.1 0003	13.1 Correspondence	Letter/Water pollution control requirements and best practicable control technology with attached letter from Representative Al Ullman to Donald Dubois of EPA	4/26/78	3	Donald Dubois/EPA	Al Ullman/U.S. House of Representatives	
AR 13.1 0004	13.1 Correspondence	Letter/Citizen concern regarding disposal location for TWCA sludge with attached routing slip, memorandums regarding preparation of response to letter, copy of letter from citizen to Senator Hatfield, and two articles regarding radioactive wastes	2/9/83	10	John Spencer/EPA, Region X	Robert Packwood/U.S. Senate	
AR 13.1 0005	13.1 Correspondence	Letter/Citizen concern regarding wastes produced and disposed by TWCA	4/16/86	3	Michael Gearheard/Oregon Operations Office-EPA	Jim Weaver and Mitchell Rothman/U.S. House of Representatives	
AR 13.1 0006	13.1 Correspondence	Letter/Citizen concern regarding delays in cleaning up radioactive waste stored at TWCA with attached letter from citizen to Senator Hatfield and letter from Hatfield to EPA	1/7/88	7	Robie Russell, Regional Administrator/EPA, Region X	Mark Hatfield/U.S. Senate	

SECTION 14.0 PUBLIC PARTICIPATION

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
14.1 Correspondence							
AR 14.1 0001	14.1 Correspondence	Letter/Citizen comments on attached EPA circular regarding hazardous waste management	7/23/79	4	Joseph Spiruta, Citizen	Donald Dubois/EPA, Region X	
AR 14.1 0002	14.1 Correspondence	Letter/Citizen concern over perceived lack of action by EPA and Oregon Department of Environmental Quality (DEQ) with attached request from EPA to citizens to comment on draft Public Participation Policy	5/20/80	3	Joseph Spiruta, Citizen	Sharon Francis, Assistant to the Administrator/EPA, Region X	
AR 14.1 0002-1	14.1 Correspondence	Letter/Adequacy of Oregon waste disposal laws and request for formation of citizens committee	9/1/83	1	Lloyd Marbet/Forelaws on Board	Governor Victor Atiyeh/State of Oregon	
AR 14.1 0002-2	14.1 Correspondence	Letter/Request for information regarding applications for permit to operate hazardous waste management facility, EPA regulations, and regulatory action taken or contemplated regarding Teledyne Wah Chang Albany (TWCA)					
AR 14.1 0002-3	14.1 Correspondence	Letter/DEQ response to 7/25/83 hazardous industrial waste fire on TWCA property with attached newspaper articles regarding the fire	9/1/83	3	Lloyd Marbet/Forelaws on Board	William Young/DEQ	
AR 14.1 0002-4	14.1 Correspondence	Letter/Response to request for formation of a citizens committee to review Oregon waste disposal laws	9/83	1	Governor Victor Atiyeh/State of Oregon	Lloyd Marbet/Forelaws on Board	
AR 14.1 0002-5	14.1 Correspondence	Letter/Request for information on TWCA	1/23/84	1	A. Patton/Willamette University	DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 14.1 0002-6	14.1 Correspondence	Letter/Request for information on TWCA	1/28/84	1	Kristen Elliott	William Young/DEQ	
AR 14.1 0002-7	14.1 Correspondence	Letter/Request for information on TWCA	1/28/84	1	Kristen Elliott	Committee on Synthetic Chemicals in the Environment-Laboratory Services	
AR 14.1 0002-8	14.1 Correspondence	Letter/Request for information on TWCA	1/28/84	1	Kristen Elliott	Ed Zajonc, Director/ Division of State Lands	
AR 14.1 0002-9	14.1 Correspondence	Letter/Request for information on TWCA	2/9/84	1	Kristen Elliott	Richard Reiter/DEQ	
AR 14.1 0002-10	14.1 Correspondence	Letter/Response to request for information on TWCA	2/10/84	1	Ed Zajonc/Division of State Lands	Kristen Elliott	
AR 14.1 0002-11	14.1 Correspondence	Letter/Response to request for information on TWCA	2/10/84	1	H. Michael Wehr/Committee on Synthetic Chemicals in the Environment	Kristen Elliott	
AR 14.1 0002-12	14.1 Correspondence	Letter/Response to request for information on TWCA	2/16/84	1	Stanley Sturges/DEQ	Kristen Elliott	
AR 14.1 0002-13	14.1 Correspondence	Letter/Request for information on TWCA	2/84	1	Buford Roche	DEQ	
AR 14.1 0002-14	14.1 Correspondence	Letter/Response to request for information on TWCA	2/28/84	1	Stanley Sturges/DEQ	A. Patton	
AR 14.1 0002-15	14.1 Correspondence	Letter/Response to request for information on TWCA	3/84	1	Fred Hansen, Director/DEQ	Buford Roche	
AR 14.1 0003	14.1 Correspondence	Routing slip/Resource list of elected officials to contact for interviews	3/30/87	6	Tim Brincefield/EPA, Region X	Neil Thompson/EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 14.1 0004	14.1 Correspondence	Letter/Assistance in setting up meeting and interviews with local residents to discuss community concerns	4/15/87	1	Tim Brincefield/EPA	Clayton Wood, Mayor/Millersburg, Oregon	
AR 14.1 0004-1	14.1 Correspondence	Schedule for community assessment interviews	5/20/87	2	ICF Consulting Associates Incorporated		
AR 14.1 0005	14.1 Correspondence	Letter/Citizen concern and request for information regarding lime solids disposal plans and regulations	6/2/87	2	Ray Paris/Oregon Department of Human Resources (DHR)	Lloyd Marbet/Forelaws on Board	
AR 14.1 0006	14.1 Correspondence	Letter/Meeting and review of proposal from TWCA for relocation of sludges from ponds	6/4/87	1	Timothy Brincefield/EPA	Lloyd Marbet/Forelaws on Board	
AR 14.1 0007	14.1 Correspondence	Transmittal letter/Fact sheets regarding Superfund and TWCA	6/4/87	1	Timothy Brincefield/EPA	Joyce Martinak/League of Women Voters	
AR 14.1 0007-1	14.1 Correspondence	Memorandum/Addition of Lloyd Marbet of Forelaws on Board to mailing list	6/5/87	1	Unknown/DEQ	Tom Miller/DEQ	
AR 14.1 0008	14.1 Correspondence	Memorandum/Draft community relations plan, Fact Sheets regarding community relations plan and remedial investigation/feasibility study (RI/FS) work plan components	10/19/87	2	Tim Brincefield/EPA	Files/EPA, Region X	
AR 14.1 0008-1	14.1 Correspondence	Letter/Request for information prepared by DEQ regarding the application of CERCLA to TWCA and request for copies of all agency rules and state laws which DEQ must enforce in the disposal of solid waste	2/24/88	1	Lloyd Marbet/Forelaws on Board	Tom Miller/DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 14.1 0008-2	14.1 Correspondence	Letter/Response to request for information prepared by DEQ regarding the application of CERCLA to TWCA	3/16/88	1	Tom Miller/DEQ	Lloyd Harbet/Forelaws on Board	
AR 14.1 0009	14.1 Correspondence	Letter/Clarification of EPA position on relocation of lime solids from TWCA with attached letter from Peter Ryan to Oregon Operations Office of EPA	3/30/88	4	Michael Gearheard/Oregon Operations Office-EPA	Peter Ryan/Ryan Communications	
14.2 Community Relations Plan							
AR 14.2 0001	14.2 Community Relations Plan	Community relations plan for the performance of remedial response activities at TWCA	11/87	30	Camp Dresser & McKee, Inc.	EPA, Region X	
14.3 Fact Sheets/Press Releases							
AR 14.3 0001	14.3 Fact Sheets and Press Releases	Fact sheet/Application for renewal of a National Pollutant Discharge Elimination System (NPDES) permit with attached notice of public hearing regarding permit	7/14/78	5	DEQ		
AR 14.3 0002	14.3 Fact Sheets and Press Releases	Press release/Level of radioactivity in two TWCA sludge ponds	2/15/87	1			
AR 14.3 0002-1	14.3 Fact Sheets and Press Releases	Press release/Cleanup of radioactive sludge on the Willamette River bank	3/20/87	2	Moba Media, Inc.		
AR 14.3 0003	14.3 Fact Sheets and Press Releases	Fact sheet/Superfund project update for TWCA	4/1/87	4	EPA, Region X	General public	
AR 14.3 0004	14.3 Fact Sheets and Press Releases	Press release/Relocation and storage of lime solids with attached maps of proposed storage site	5/1/87	5	TWCA		
AR 14.3 0005	14.3 Fact Sheets and Press Releases	Press release/EPA taking primary responsibility for considering TWCA request to relocate lime solids	6/22/87	6	TWCA		

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 14.3 0005	14.3 Fact Sheets and Press Releases	Press release/EPA taking primary responsibility for considering TWCA request to relocate lime solids	6/23/87	2	TWCA-Ryan Communications		
AR 14.3 0006	14.3 Fact Sheets and Press Releases	Fact sheet/RI/FS work plan, draft community relations plan, and the sludge ponds	9/87	3	Neil Thompson/EPA, Region X and Jo Brooks/DEQ		
AR 14.3 0007	14.3 Fact Sheets and Press Releases	Fact sheet/Radioactive waste disposal in Oregon and current regulations and health hazards of radioactive isotopes	Unknown	9	Citizens for Responsible Radioactive Waste Disposal		
AR 14.3 0008	14.3 Fact Sheets and Press Releases	Press release/A synopsis of the lime solids issue	2/88	4	Jim Denham/TWCA		
AR 14.3 0009	14.3 Fact Sheets and Press Releases	Fact Sheet/The Proposed Plan. An announcement of the public comment period and public meeting	8/16/89	7	Neil Thompson/EPA	General Public	
AR 14.3 0010	14.3 Fact Sheets and Press Releases	Fact Sheet/Announcement of an Extension of the public comment period	9/27/89	2	Neil Thompson/EPA	General Public	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
	14.4 Comments and Responses						
AR 14.4 0001	14.4 Comments and Responses	Letters/Placement of TWCA on list of Superfund sites	9/82-10/19/82	22	Please see document	Please see document	
	14.5 Notice of Public Meetings						
AR 14.5 0001	14.5 Notice of Public Meetings	Notice/Application for NPDES permit meeting held on 8/17/78	7/14/78	5	DEQ		
	14.6 Public Meeting Transcripts						
AR 14.6 0001	14.6 Public Meeting Transcripts	Transcript of public meeting held at Linn-Benton Community College 09/06/89. See AR 14.6 0002	9/06/89	71	EPA	General Public	
AR 14.6 0002	14.6 Public Meeting Transcripts	List of corrections for transcript of public meeting cited in AR 14.6 0001	10/12/89	1	Michelle Pirzadeh/EPA	General Public	

SECTION 15.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
	15.1 Maps and Photographs						
AR 15.1 0001	15.1 Maps and Photographs	Diagram and explanation of zirconium production	3/15/76	2	Teledyne Wah Chang Albany (TWCA)		
AR 15.1 0002	15.1 Maps and Photographs	Photographs/Lower River Sludge Pond	11/28/77	3	Unknown		
AR 15.1 0003	15.1 Maps and Photographs	Map/Solid storage pond and pond #5 site plan	3/15/82	1	TWCA	EPA, Region X	Actual map located at EPA Region X Headquarters in Seattle, Washington

SECTION 15.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

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15.1 Maps and Photographs							
AR 15.1 0001	15.1 Maps and Photographs	Diagram and explanation of zirconium production	3/15/76	2	Teledyne Wah Chang Albany (TWCA)		
AR 15.1 0002	15.1 Maps and Photographs	Photographs/Lower River Sludge Pond	11/28/77	3	Unknown		
AR 15.1 0003	15.1 Maps and Photographs	Map/Solid storage pond and pond #5 site plan	3/15/82	1	TWCA	EPA, Region X	Actual map located at EPA Region X Headquarters in Seattle, Washington
AR 15.1 0004	15.1 Maps and Photographs	Map/Location of water bodies and monitoring wells in TWCA area	5/21/82	1	TWCA	EPA, Region X	Actual map located at EPA Region X Headquarters in Seattle, Washington
AR 15.1 0005	15.1 Maps and Photographs	Map/TWCA plant layout	Unknown	1	TWCA		
15.2 Technical Sources							
AR 15.2 0001	15.2 Technical Sources	Report entitled "Zirconium Hazards and Nuclear Profits"	1979	47	Pacific Northwest Research Center	Unknown	
15.3 Guidance Documents							
AR 15.3 0001	15.3 Guidance Documents	List of guidance documents	No date	2			

SECTION 16.0 CONFIDENTIAL PORTION

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.1.3 0002	2.1.3 Nonferrous Metals Industry Study and Final Trip Report	EPA Final Trip Report with attached sampling data	6/19/80	27	Roger Jungclaus/Sverdrup & Parcel and Associates, Inc.	Thomas Nelson, Manager/Teledyne Wah Chang Albany (TWCA)	
AR 2.2.4 0001	2.2.4 Treatment of Industrial Process Wastewater Discharges	Confidential information regarding to report entitled "Treatment of Industrial Process Wastewater Discharges at Teledyne Wah Chang Albany"	2/15/84	43	Charles Knoll/TWCA	Paul Day/EPA	
AR 2.2.10 0003	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information package on process for recovery of recyclable materials from the magnesium resource recovery pile	10/3/83	23	Thomas Nelson/TWCA	John Borden/Oregon Department of Environmental Quality (DEQ)	
AR 2.2.10 0004	2.2.10 Magnesium Chloride Treatment Process	Review and conditional approval of information package on process for recovery of recyclable materials from the magnesium resource recovery pile	10/19/83	3	Stanley Sturges/DEQ	Thomas Nelson/TWCA	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0005	2.2.10 Magnesium Chloride Treatment Process	Letter/Response to review and conditional approval of information package on process for recovery of recyclable materials	10/26/83	5	Thomas Nelson/TWCA	John Borden/DEQ	
AR 2.2.10 0006	2.2.10 Magnesium Chloride Treatment Process	Letter/Modification to information package on process for recovery of recyclable materials	11/3/83	1	Stanley Sturges/DEQ	Thomas Nelson/TWCA	
AR 2.2.10 0007	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information and engineering specifications on the installation and operation of the first phase of the process to recover recyclable materials from the magnesium resource recovery pile	1/5/84	56	Charles Knoll/TWCA	Stanley Sturges/DEQ	
AR 2.2.10 0008	2.2.10 Magnesium Chloride Treatment Process	Memorandum/Notice of Intent to Construct and Request for Construction Approval	2/7/84	3	David St. Louis/DEQ	Charles Knoll/TWCA	
AR 2.2.10 0009	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Photographs taken on 3/20/84 in the smokehouse thermal treatment facility	5/22/84	3	Charles Knoll/TWCA	Paul Day/EPA, Region X	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0010	2.2.10 Magnesium Chloride Treatment Process	Letter/Final process procedure details and associated trial data for recovery process for recyclable materials from the magnesium resource recovery pile	7/9/84	1	Stanley Sturges/DEQ	Charles Knoll/TWCA	
AR 2.2.10 0011	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Information and specifications on installation and operation of the process for recyclable materials from the magnesium resource recovery pile	7/27/84	7	John Bohmker/TWCA	Stanley Sturges/DEQ	
AR 2.2.10 0012	2.2.10 Magnesium Chloride Treatment Process	Memorandum/Notice of Intent to Construct and Request for Construction Approval	10/24/84	3	Stanley Sturges/DEQ	Chuck Knoll/TWCA	
AR 2.2.10 0013	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 10/84 and 11/84	1/17/85	11	Charles Knoll/TWCA	Stanley Sturges/DEQ	
AR 2.2.10 0014	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 12/84, 1/85, and 2/85	4/4/85	16	Charles Knoll/TWCA	David St. Louis/DEQ	
AR 2.2.10 0015	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 3/85 and 4/85	6/25/85	11	Charles Knoll/TWCA	David St. Louis/DEQ	

Doc #	File	Type/Description	Date	Pgs	Author/Organization	Addressee/Organization	Doc Location
AR 2.2.10 0016	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports on process for 5/85, 6/85, and 7/85	11/13/85	16	Charles Knoll/TWCA	F.A. Skirvin/DEQ	
AR 2.2.10 0017	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly report on process for 1/86	1/86	19	TWCA	DEQ	
AR 2.2.10 0018	2.2.10 Magnesium Chloride Treatment Process	Report entitled "Field Trial for Land Application of Magnesium Resource Recovery Process Residue"	2/86	27	CH2M Hill	TWCA	
AR 2.2.10 0019	2.2.10 Magnesium Chloride Treatment Process	Transmittal letter/Monthly reports for process for 3-8/86	1/30/87	49	Charles Knoll/TWCA	F.A. Skirvin/DEQ	
AR 3.2 0004	3.2 Background Reports	Portions of report entitled "Characterization of the Content of the Lower River Solids Storage Pond and the Upper River Solids Storage Pond"	Unknown	15	Unknown		